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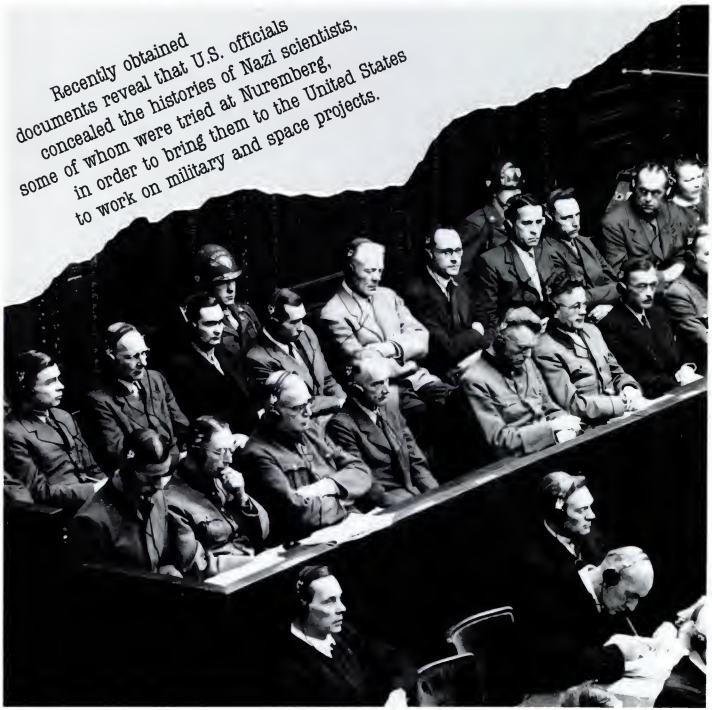

U.S. Coverup of Nazi Scientists

Threats to ABM Treaty
Reshaping NATO Policy

INSIDE PUGWASH NEWSLETTER
Special newsletter for Bulletin readers on the Pugwash conferences

April vol. 2 no. 8

Pugwash schedules crucial meetings for 1985

As this issue of the Pugwash newsletter goes to press the international climate — the relationship between the superpowers — seems less ominous than it has for some time. The agreement between Mr. Shultz and Mr. Gromyko is one of the more positive signs, even though it is qualified and hedged about by confusing public statements.

Yet all in all, what exists at present is an agreement to plan for the resumption of talks. Much groundwork must be laid, and this must be done in an atmosphere of public posturing, and contradictory national policy.

At the same time, the Pugwash meetings are continuing. *They* are taking place as a part of a process that has been going on for thirty years. Since the Einstein-Russell manifesto of 1955, prominent scientists from east and west have been meeting, without publicity; and they have been responsible for some of the most important breakthroughs achieved — laying the groundwork for the SALT treaty, the nuclear test-ban treaty, etc.

Although Pugwash has expanded its concerns from those raised by the Einstein-Russell manifesto, and its participants represent not only the original east-west focus, but also a north-south perspective, its main concern - preventing a nuclear holocaust - remains central.

Thus, in the present climate the Pugwash meetings are more important than ever. They represent continuity, take place in a climate of mutual respect, and are part of a process deemed by all participating nations to be very important, and frequently — critical.

Meetings planned for '85

The tentative schedule, recently released by the Pugwash steering committee is as follows:

March: Second Workshop of Study Group on Conventional Forces in Europe, Pocking (Munich), FRG
April: Workshop on Crisis Prevention and Control in Africa, Lusaka, Zambia
May: 12th Workshop on Nuclear Forces, Geneva, Switzerland
June: Latin American Regional Symposium on Latin American Security, University of Campinas, Sao Paulo, Brazil
July: 35th Conference, University of Campinas, Sao Paulo, Brazil
September: 48th Pugwash Symposium: "Political Conditions for Peace and Security in Europe: Obstacles and Perspectives", Bochum, FRG
October: Pugwash/SIPRI 11th Workshop on Chemical Weapons: Implications for the Chemical Industry of a Chemical Weapons Convention, Stockholm, Sweden
November: Symposium on Arms in Space, London, U.K.
December: 13th Workshop on Nuclear Forces, Geneva, Switzerland

Expanding concerns retain central focus

Although the calendar of future Pugwash meetings reveals a widening range of issues, the central focus remains constant. And this focus, preventing nuclear war, is one which you too, as a *Bulletin* reader, regard as critical.

The Pugwash scientists are asking you to join them in their work in 1985, by becoming a Friend of Pugwash. As a Friend of Pugwash you will receive copies of unpublished reports and newsletters, and so will be kept up to date on Pugwash's work. You will be able to keep abreast of the positions taken by the various nation's scientists, and also to have, in detail, the statements issued after each meeting.

Thus you will be aware of the concrete proposals, the reasoning behind them, and the technical issues Pugwash participants feel it is essential to consider. At the same time, your participation will help to keep Pugwash going. Without any official government support, its survival depends on people like you, who understand the value of its work, and the role that scientists committed to its processes can play.

Please don't delay. Plans for 1985 are contingent on adequate support, and your help is needed. Fill out the form below and become a Friend of Pugwash...today.

APRIL 1985
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Bulletin of the Atomic Scientists

The Bulletin Clock, symbol of the threat of doomsday hovering over humanity, stands at three minutes to midnight.

On the cover: Among the 23 defendants at the U.S. military tribunal at Nuremberg charged with conducting experiments on humans were four men who worked for the U.S. military: Kurt Blome (front bench, rightmost full figure); Siegfried Ruff (rear bench, leftmost); Hermann Becker-Freysing (rear bench, fourth from left); and Konrad Schaefer (rear bench, sixth from left). December 12, 1946 photo courtesy U.S. Army Signal Corps, DAVA. Cover design: Lisa Grayson. (See "U.S. Coverup of Nazi Scientists" by Linda Hunt, pages 16–24.)

Official secrecy fostered coverup

"A FEW WEEKS AGO, the [U.S.] Army revealed another of its secrets: the employment in this country of a considerable number of German scientists and technicians," Hans Bethe and H.S. Sack wrote in the February 1947 *Bulletin*. They noted that although "it has been known for some time" that the military was bringing German specialists here on a temporary basis to provide technical information, the recent reports "create an uneasy feeling that the deal was not as straightforward as could be wished."

Bethe and Sack acknowledged the U.S. military's responsibility to keep abreast of technical developments such as the German jet and rocket propulsion systems, but argued against allowing these specialists to immigrate. "Is it wise, from a long-range point of view, or even compatible with our moral standards, to make this bargain? Would it not have been better to restrict definitely the stay of these scientists in this country to the absolute minimum? For it must be borne in mind that many of them, probably the majority, are die-hard Nazis, or at least worked whole-heartedly with the Nazis; otherwise they would not have held their high posts so vital for the Nazi war machine."

Such protests—including an indignant December 1946 statement by Albert Einstein, Norman Vincent Peale, and other prominent individuals—soon died down due to a lack of public information about the details of the U.S. program. The request by Bethe and Sack that "the mystery shrouding this affair be lifted, that an exact account be given of what has been promised to whom" went unanswered by the U.S. government.

Today, 40 years after the defeat of Nazi Germany, that mystery and secrecy are lifted decisively by journalist Linda Hunt in this issue of the *Bulletin*. Based primarily on documents obtained under the Freedom of Information Act during the past 18 months, Hunt's article shows that U.S. officials in charge of Project Paperclip—the program to exploit German and Austrian specialists—concealed incriminating information about Nazi scientists and technicians so they could legally immigrate along with other specialists. The article documents a coverup that included military officials withholding information from their State and Justice Department counterparts and giving some Nazi scientists "clean" reports despite derogatory evidence in the military's own files.

The full scope of the coverup is unclear, but some U.S. officials involved in it justified their actions as necessary to keep Nazi specialists from the Soviets. Instead, however, of making such arguments in public—thereby risking controversy and perhaps losing the debate to persons with greater qualms about overlooking atrocities—these officials simply hid behind a wall of sanctioned secrecy. (A rigid secrecy system continues to conceal the details of Soviet exploitation of Nazi scientists.) Hunt's article provides the public with important, if disturbing, facts that help fill in the historical record about post-World War II collaboration with Nazis.

This article also is a timely warning that official secrecy breeds abuse. Behind its curtain, government officials can act arbitrarily, safe in the knowledge that they will not be held accountable. They can lie or distort the truth, as Harrison Brown reports in this issue. While there is a narrow category of vital national security information that should be kept secret from potential enemies, in case after case the public has been perceived as the enemy. For example, the "secret" U.S. bombing of Laos and Cambodia, during the Vietnam War, was no secret there, only here. Official secrecy is a norm in totalitarian societies; it is a dangerous threat to democracies.—Len Ackland

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Fallout and falsehoods

by Harrison Brown

NEARLY A YEAR has passed since U.S. District Judge Bruce Jenkins awarded $2.6 million to the families of 10 people who had allegedly contracted cancer as a result of an extended series of above-ground nuclear tests in Nevada in the 1950s and early 1960s. The government is now in the process of appealing the May 1984 decision in favor of the plaintiffs, who were among 24 test cases chosen to represent 1,192 alleged victims. In his opinion, which took 17 months to write, Jenkins said the government "failed to adequately warn the plaintiffs or their predecessors of known or foreseeable long-range biological consequences" from the fallout.

Thirty years ago my colleague at the California Institute of Technology, the distinguished geneticist Edward P. Lewis, told me that on the basis of his studies of leukemia rates among radiologists, the fallout from above-ground nuclear tests would probably result in a significant increase in leukemia rates in exposed populations.

By 1954 some 35 nuclear weapons had been exploded in various parts of the world, most of them by the United States. From 1955 on, the rate of testing increased so rapidly that it was difficult for the concerned observer to follow them. Many of us took Lewis's estimates seriously and urged that nuclear testing be stopped.

I was an advisor to Adlai Stevenson in the 1956 presidential campaign when he made nuclear testing a major issue. Stevenson's opposition to nuclear testing was strongly criticized by officials in the Eisenhower Administration, notably Vice-President Richard Nixon, Atomic Energy Commission (AEC) Chairman Lewis Strauss, and Willard Libby, a distinguished scientist who was a member of the AEC, as well as by Edward Teller. They argued that nuclear testing was essential for the defense of the free world. Libby claimed that the risks involved in fallout were no greater than the normal risks encountered in everyday life such as swimming at the beach.

Ten scientists at the California Institute of Technology made a public statement supporting the Stevenson proposal and declaring that this type of risk was quite different from the voluntary risk of swimming at the beach. Those exposed to fallout from nuclear tests in Nevada, we pointed out, had no choice in the matter. To be sure, the risks might not be great when compared with the normal incidence of cancer, but nevertheless we believed them to be measurable. We wondered what gave government officials the right to mislead scores of civilian bystanders with soothing assurances that they would suffer no harm.

When the Caltech statement received considerable national attention, John A. McCone, a member of Caltech's Board of Trustees and chairman of its fundraising committee, demanded that the 10 of us be fired. Lee DuBridge, the president of Caltech, refused to consider such an action, and McCone resigned from the Board. In 1958 Eisenhower made him chairman of the Atomic Energy Commission.

Worldwide concern about fallout also increased in the late 1950s, and eventually, in 1963, the Soviet Union, the United States, and most other members of the United Nations signed a treaty banning all nuclear tests on the ground, in the water, and in space, but permitting tests underground. Although this was an excellent step forward, much damage had already been done.

Contributing to this damage were U.S. government officials who failed to warn the public about the potential dangers of fallout and even engaged in misrepresentation and distortion bordering upon lies. Do we have any reason to believe that events like this won't happen again? Unfortunately not, if we are to judge from a number of environmental cases in recent years and statements issued by the officials responsible.

Several aspects of environmental health cases make them particularly difficult to deal with in conventional legal ways:

- There is the problem of delayed health effects which may not become apparent until one, two, or even three decades have passed. In the fallout case government attorneys argued that even if evidence showed fallout from the test caused the cancers, the statute of limitations had elapsed before the suits were filed in 1979.
- Another problem involves invoking "national security" to protect government interests. The government attorneys in the fallout case argued that the government should be immune from court claims because it was conducting the tests to ensure the safety of the nation.

Significantly, Jenkins ruled against both of these claims.

- The third problem is by far the most difficult. Fallout and other environmental poisons produce biological problems which may also occur naturally. For example, there might be an elevation of the leukemia rate in a particular area, but which of those cases would have occurred anyway, and which were caused by the superimposed stress? In other words, who should be the beneficiaries of the judgment? This is a question which can never be answered precisely.

Our only real safeguard against such extremely difficult problems is to do everything we can to avoid them in the first place. The first priority must be to have government officials be honest with the public. □

Nuclear backpacks

by William M. Arkin

ONE SHOULD THINK twice about a nuclear weapon whose instructions include what to do if it's a dud. The 1980 Operator's Manual for Atomic Demolition Munitions (ADMs) states matter-of-factly: "Failure of the system to produce an explosion after using all available options is defined as a dud." "When it has been ascertained that the system will not fire," the manual instructs the hapless soldier to "retrieve" the nuclear warhead and "perform emergency procedures (safing, disarm, and post-disarm). . . . There is a possibility of accidentally detonating a weapon that is a dud."

If ever a nuclear weapon merited immediate retirement, it is this one. ADMs, which are nuclear land mines, cannot deter potential aggressors because they are so inconsequential in tactical terms. Their officially stated mission of border defense is militarily and politically untenable. But their secret commando missions are far more important and deserve close scrutiny.

The U.S. military has deployed two types of ADMs since the mid-1960s: the Medium ADM (MADM) and the Special ADM (SADM). There are 608 ADMs in the U.S. arsenal, 372 stored in Europe (West Germany and Italy), 21 in the Pacific (South Korea and Guam), and 215 in the United States. They are operated by about 750 ADM specialists in the Army and 200 in the Navy and Marine Corps. In addition, engineers and commandos from Belgium, Britain, Greece, Italy, the Netherlands, Turkey, and West Germany are also trained to use ADMs. The larger MADM weighs 400 pounds, including firing devices and cables, and is emplaced by a six-man engineer team attached to combat units. The 58.5 pound SADM can be delivered by a two-man commando team. MADMs have an explosive yield as high as 12,000 tons of TNT—equivalent to the Hiroshima bomb. SADMs have a yield of 250 tons. The SADMs are detonated by timer while MADMs can be detonated by timer or remote command.

A 1975 report to Congress by Secretary of Defense James Schlesinger on nuclear weapons in Europe stated that "ADMs are nuclear demolition devices which . . . can be used to destroy bridges, cave in tunnels or defiles [narrow passages or gorges], cut roads, and otherwise create barriers to slow enemy movement or induce concentrations of his forces." A more recent Army manual states that ADMs are "an economy of force measure to contribute to flank and rear security, impede a counterattack, and assist in enemy entrapment." Both statements assume that the nuclear mines will be buried to face waves of enemy tanks.

Army manuals further support this idea, saying the specific targeting purposes of ADMs are:

- blocking avenues of approach by cratering defiles or creating rubble;
- severing routes of communication by destroying tunnels, bridges, canal locks, or cratering roads;
- creating areas of tree blowdown or forest fires;
- cratering areas subject to hostile airmobile landings;
- creating water barriers by destroying dams and reservoirs.

THE RECENT controversy over ADMs, however, centers on other questions. Two NBC Nightly News stories in January highlighted the secret commando uses of the nuclear mines, as well as plans to use them "behind enemy lines." By exposing little-known details about these obscure nuclear weapons, and raising questions for which there are no answers, these reports led West German Defense Minister Manfred Wörner to pledge that he would ask the United States to remove ADMs from Europe at the earliest opportunity.

All previous public discussion of ADMs had been based on two major issues: that they undermine civilian control because they require some sort of predelegation of authority to fire them; and that they would be exploded on friendly territory and would require "prechambering" (that is, prior preparation of emplacements) to be effective.

The use of ADMs on friendly territory has been their most controversial feature. One Army manual *Nuclear Weapons Employment Doctrine and Procedures*, states:

> ADM[s] are normally employed in areas under friendly control and are integrated with barrier plans and fire

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> support plans. . . . Because there is no delivery error in the emplacement of the ADM, the smallest yield necessary to destroy the target or create the obstacle may be used, thereby minimizing damage to the surrounding area.

But an Army engineer manual is not quite so sanguine about local damage: "Since ADMs produce side effects (blast, thermal, radiation) that extend to significant distances and may or may not be desirable, safety of nearby troops or any civilians becomes a major consideration in the use of ADMs." And an engineer officer writing in 1975 stated: "Collateral damage could be expected in populated areas [in West Germany], as villages tend to nestle in the valleys at or near ideal ADM sites."

Restrictions on "prechambering" nuclear munitions, together with NATO guidelines worked out in 1970 for their use, alleviated some of the problems over ADMs in Europe but left others unsolved. Though the West German government vigorously denied NBC stories about the plans for two-man teams to carry SADMs "behind enemy lines" in "backpacks," all available evidence indicates that this is becoming the primary mission of ADMs—largely because of the political restrictions on their traditional uses in support of conventional military operations.

Robert Neubecker, United States

The commando mission of SADMs has been referred to on a number of occasions. Two U.S. Army officers stated in the November 1982 issue of the Army's magazine, *Military Review*: "U.S. Special Forces units have the capability to employ atomic demolitions to destroy key installations and facilities deep inside enemy territory." A declassified 1983 "Command Briefing" for Army special forces says that "Special Atomic Demolitions Munitions training is continuously emphasized. The SADM capability is considered to be an important mission of special forces, and is continuously exercised in quarterly nuclear surety inspections and field exercises. The device can be deployed either by static line, military free fall, or by scuba."

A FASCINATING question raised by the current attention to SADMs is: What constitutes "enemy territory"? The Army staff manual that deals with nuclear weapons policy reveals that the war plans for use of ADMs would include "destruction of installations, facilities, and industrial complexes that could have military significance if in enemy hands." In other words, nuclear land mines would be used during a war to destroy factories and power stations in Western Europe in the face of an advancing enemy. This explains why another Army manual refers to the ADM mission of "creating rubble" in towns and cities.

One advantage of the small SADMs, according to an officer on the operations staff of the Army, is that the weapons have "no delivery error." They can, he said, be dropped from Army helicopters, as well as carried in "backpacks." To bear this out, he cited an Army manual which states that "unconventional warfare teams can also employ ADM[s] and chemical weapons with exceptional selectivity." In exercise "Brave Shield 80," unconventional warfare forces played out such plans for Special ADMs for the first time in a full-scale U.S. maneuver. Since then, SADM missions have been added to the unconventional warfare plans of the U.S. Central Command for the Persian Gulf.

Despite the October 1983 NATO decision taken in Montebello, Canada, to withdraw 1,400 nuclear warheads from the European stockpile, and Defense Minister Wörner's desire to rid West Germany of the 350 nuclear land mines currently stored there, it does not appear that ADMs will die a natural death. While larger MADMs are slated for retirement, nuclear weapons designers have been trying for years to sell different new designs for the next generation of small ADMs.

In 1976, it was the Tactical Earth Penetrator warhead. This ultimately became the Earth Penetrator Warhead option for the Pershing II missile, which was cancelled in January 1981. Later, Energy Department scientists offered the Shallow Burst Munition and the Nuclear Cratering Device to the Army. But the Defense Department's fiscal 1983 Research, Development, and Acquisition Report seemed to sound the death-knell for the ADM when it stated that "there are no plans to replace land-based defensive TNF [Theater Nuclear Force] systems with new nuclear weapons. The number of ADMs and Nike Hercules will be gradually reduced as improved conventional capabilities are achieved."

Nonetheless, buried in the Energy Department's 685-page first volume of fiscal 1986 budget justifications for "Atomic Energy Defense Activities" is a "candidate system" for the next generation "small atomic demolition munition." The new warhead, designed by the Livermore Laboratory in California, was discussed in the Laboratory's 1984 Report and will prove to be an even smaller and more usable weapon.

The director of Livermore announced that the laboratory had already "tested and evaluated a prototype of a versatile new family of lightweight, low-yield fission devices. One application of this device might be in a modern atomic demolition munition." Defense officials have already dubbed the new mini-nuke "ADAM," for Advanced ADM. □

The "other nations" speak up

by Christopher Paine

AS THE REAGAN Administration swaddles its $48 billion budget request for nuclear weapons programs in the protective blanket of "bargaining leverage"—while Soviet leaders sternly pledge to maintain parity at all costs—the rest of the world is growing increasingly restive with the glacial progress afforded by this coercive approach to negotiations. During late January meetings in New Delhi and Athens, heads of government from five continents met privately to discuss the impasse in the superpower arms talks and the ways they might intercede to bring about swift adoption of a comprehensive freeze and reductions in nuclear weapons.

Brought together initially under the auspices of the Parliamentarians for World Order, an organization of elected legislators from some 30 countries, the six leaders of the Five Continent Peace Initiative—Presidents Raul Alfonsin of Argentina, Miguel de la Madrid of Mexico, and Julius Nyerere of Tanzania, and Prime Ministers Olof Palme of Sweden, Andreas Papandreou of Greece, and Rajiv Gandhi of India—welcomed the resumption of bilateral U.S.-Soviet negotiations in their January 28 joint declaration ("The Delhi Declaration"), noting that they "attach great importance to the proclaimed objective of these negotiations: to prevent an arms race in space and to terminate it on earth, ultimately to eliminate nuclear arms everywhere."

Cynical practitioners of realpolitik, of course, would be quick to dismiss this statement as an egregious display of naivete or, perhaps, calculated diplomatic posturing. After all, how could any sane person actually believe that either the United States or the Soviet Union would genuinely pursue their publicly professed, mutually agreed objectives for the negotiations?

But these leaders are neither disingenuous nor naive. They intend to mobilize global pressure on the "two major nuclear weapon powers to implement their undertaking and . . . to produce, at an early date, significant results." These leaders' unique global political perspective—long missing from the conference table in Geneva—was eloquently articulated at New Delhi by President Alfonsin:

> In a few minutes a small group of people can destroy everything that each human being on this planet has—beginning with his own life and the life of his kin—and everything a nation has built through the centuries. And all this can be done without hearing our voice, without taking into account our will, without us ever knowing about it. . . . How did we get to this absurd situation? Simply because the superpowers and the nuclear powers, minding the legitimate needs of their own defense, have applied traditional war criteria in a world armed today with new weapons completely different from the ones used before. . . .
>
> It really does not matter whether those who have that power [to start a nuclear war] have good or bad judgment, good or bad will. What matters is that the power exists, even if it is not something desirable, and that the legitimate right of the superpowers to secure their own defense has, in reality, become senseless even for themselves. . . .
>
> There are those who think that there will not be a nuclear holocaust because, so far, there has not been one. They are wrong. If the same criteria that have prevailed in the arms race continue being implemented, the nuclear holocaust will inexorably occur, sooner or later.
>
> There are those who have given up and accept the holocaust as inevitable. They, too, are wrong. Nuclear war in itself is not part of the biological data that we cannot escape; it is a political fact that we can and must prevent.

In the Delhi Declaration the six leaders reiterated their May 1984 appeal for "an all-embracing halt to the testing, production and deployment of nuclear weapons and their delivery systems," but then zeroed in on two specific steps which "today require special attention: the prevention of an arms race in outer space, and a comprehensive test ban treaty."

"Outer space must be used for the benefit of mankind as a whole, not as a battleground of the future," they noted in their call for a complete prohibition of weapons in space. In urging an immediate moratorium on nuclear explosive testing, followed by the prompt conclusion of a comprehensive test ban treaty, the leaders suggested that "such a treaty would be a major step towards ending the continuous modernization of nuclear arsenals." This twin demand strikes at the very heart of the contradictory Reagan Administration defense program, which seeks a major modernization of the U.S. offensive nuclear arsenal while also developing space weaponry with the ostensible aim of making nuclear weapons "impotent and obsolete."

SINCE ITS INCEPTION in the spring of 1984, the Five Continent Peace Initiative has been more in the nature of a minor irritant to the Reagan Administration than a serious political factor in its arms control calculus. Well aware that the world has already had its fill of noble declarations, the

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leaders are sensitive to the criticism that their initiative is lacking in concrete political steps that would provide some leverage over the superpowers.

Officials close to their deliberations note, however, that this is the year of the third Non-Proliferation Treaty review conference and that the time is ripe for generating international political pressure on the superpowers. In the wake of the New Delhi summit, the leaders are personally carrying their message to the capitals of all the nuclear weapons states. By midsummer, the Soviet Union and the United States will have been visited twice, and the lesser nuclear powers once, by individual members of the group, and their personal representatives will also visit the Soviet and U.S. delegations in Geneva.

While space weaponry is on the bargaining table—albeit ambiguously—in Geneva, such is not the case with the comprehensive test ban, and the Administration has made it clear that prospects for a ban are dim indeed. The leaders are currently examining various proposed strategies for using existing multilateral treaty mechanisms—such as the amendment provisions of the Non-Proliferation, Outer Space, and Limited Test Ban Treaties—to bring about the desired changes in the agendas, and results, of superpower arms negotiations.

Immediately following the New Delhi meeting, three of the leaders—Alfonsin, Nyerere, and Palme—flew to Athens to attend a meeting, hosted by Prime Minister Papandreou, with some 50 leaders of nongovernmental organizations as well as prominent legislators and personalities supporting the Five Continent Initiative. Peace and disarmament organizations represented at the conference included the International Physicians for the Prevention of Nuclear War; the U.S. Physicians for Social Responsibility and Nuclear Weapons Freeze Campaign; Greenpeace International; the British Campaign for Nuclear Disarmament; the Dutch Inter-Church Peace Council; and the World Council of Churches.

Former presidents and prime ministers in attendance included Pierre Trudeau (Canada), Joop den Uyl (Netherlands), Carlos Andres Perez (Venezuela), and Bruno Kreisky (Austria). Legislators currently holding office included Egon Bahr, a member of the executive committee of the West German Social Democratic Party; Relus ter Beek, chairman of the Dutch parliamentary foreign affairs committee; Helen Clark, chairwoman of the New Zealand parliament's foreign affairs committee; Thomas Downey, U.S. House of Representatives; Arturo Lizon Giner, vice-president of the Spanish senate; Silvia Hernandez, senate of Mexico; and Didymus Mutasa, speaker of the Zimbabwean parliament.

Remarking on his own initial reluctance to become involved in the initiative, Nyerere, drawing an analogy with the broad social movements which overthrew colonialism, noted the wide spectrum of governments, political parties, peace movements, and individuals represented at the meeting. He concluded the deliberations on a hopeful note: "We are beginning to be united in the same struggle. It involves all of us—North and South, East and West."

Another participant, celebrated economist John Kenneth Galbraith, cautioned the international press corps against succumbing to the occupational hazard of "associating wisdom with pessimism" where disarmament matters are concerned. Citing the achievements of the peace movements in restraining the Reagan Administration's nuclear ambition and restoring the imperative of arms control negotiations, Galbraith remarked that "in fact, something has already been accomplished."

Unable to attend the Athens meeting, West German Social Democratic Party chairman and former chancellor Willy Brandt sent a message of support which read, in part:

> We must continue to work and plead for an end to the senseless and irresponsible arms race. We must find a new approach towards security which by necessity will have to be a common security. Only an escape from the common crisis in world security and world economy likewise will assure the survival of mankind. We must stop the unproductive squandering of resources which are so urgently needed for world development. We must fight hunger and misery today rather than dreaming of space war tomorrow. The acute hunger crisis in large areas of Africa should help us come to our senses.

The strong Social Democratic Party support for the Five Continent effort provoked a mean-spirited and speciously worded response from the West German government, which only confirmed the gulf separating approved NATO doctrines of "security" from the views which propel the initiative. Alois Mertes, minister of state for foreign affairs, issued a statement attacking the leaders for neglecting the "destructive potential of modern conventional weapons" and for "totally rejecting the Western concept of preventing war by means of a combination of credible deterrence, a strategic balance of forces, and balanced arms reduction." The leaders, Mertes said, had "failed to take note of the American-Soviet negotiating aim of 'consolidating strategic stability,'" a phrase from the Shultz-Gromyko communique establishing the framework for the Geneva talks.

Mertes then went on to accuse India and Argentina, two of the nations involved in the initiative, of "jeopardizing international stability" by their refusal to ratify the Non-Proliferation Treaty, which could result in "raising the number of nuclear powers to exceed the five already authorized by" it. As for a nuclear freeze, Mertes claimed that—despite the Delhi Declaration's call for "substantial reductions in nuclear forces"—it would "codify strong numerical imbalances in some areas" and weaken the "incentive to seek a balanced reduction of weapons."

The contrast in objectives could not be more stark. Given that these sharp differences cannot be resolved by experts, Trudeau noted: "We have to reassert the primacy of politics, that is, of people, in this process. Politics is all in this race for peace." Reassuring a skeptical European peace activist that the Five Continent Initiative would muster the real political muscle to match its diplomatic flash, Papandreou observed: "The battle of the streets has become the battle of the governments." □

Attacks on Star Wars critics a diversion

by Frank von Hippel

THE DECEMBER 1984 issue of *Commentary* contained an article, "The War Against 'Star Wars,'" by Dartmouth College astrophysicist, Robert Jastrow, which attacks two technical critiques of President Reagan's Strategic Defense Initiative (SDI). One of the critiques had been written by a group organized under the auspices of the Union of Concerned Scientists (UCS) and the other by Ashton Carter for the congressional Office of Technology Assessment (OTA).[1]

The *Wall Street Journal* immediately picked up Jastrow's attack, in a December 10 editorial, "Politicized Science," which attacked the UCS and OTA reports as "less than scientific." The editorial ended with a note of concern: "It would be a shame . . . if the President fails to realize that his plan is supported by men such as Mr. Jastrow who have studied the problem carefully and scientifically." In fact, Jastrow had not himself done any scientific studies but was merely reporting somewhat breathlessly the criticisms of the UCS and OTA reports by anonymous "experts" at Lawrence Livermore and Los Alamos Laboratories.

The UCS group and Carter responded with letters to the editor of the *Wall Street Journal* published on January 2. A storm of letters supporting the editorial was then published in the January 17 edition. These included letters from: Lieutenant General Abrahamson, the director of the SDI organization; C. Paul Robinson, the principal associate director of Los Alamos National Laboratory; and Lowell Wood, the head of the X-ray laser group at Livermore National Laboratory.

At the technical level, the principal focus of the criticisms of the UCS report* was a calculation of the number of laser battle-stations that would be required in orbit to destroy Soviet ICBMs during "boost phase," the period of up to five minutes after launch while the rocket engine is still burning and before the multiple warheads and decoys are released. According to the *Wall Street Journal*, the original UCS estimate was 2,400 battle-stations, but "defense experts at Los Alamos say only 80 to 100 will do. The initial UCS error would make the difference between estimating a defense cost of say $50 billion and estimating at $1 trillion or more."

At the political level, the issue is the credibility of the technical critics of Star Wars. During the 1968–1972 debate over the anti-ballistic-missile system proposed by the Johnson and Nixon Administrations, two of the principal contributors to the current UCS report, Richard Garwin and Hans Bethe, helped to turn the scientific community against the proposed system, largely by showing in a *Scientific American* article how vulnerable it would be to countermeasures.[2]

Obviously, both sides of the new Star Wars debate remember this history. One side hopes to repeat Garwin and Bethe's success in having an impact on the policy debate with a technical assessment of the Star Wars proposal. On the other side, advocates of the SDI, whose leaders include advocates of the Johnson-Nixon ABM system such as Jastrow and Edward Teller, hope to render the critics ineffective by attacking their credibility.

THE UCS GROUP described a hypothetical battle station equipped with a hydrogen-fluoride laser producing a beam of infrared (2.7 micron) radiation with a power of 25 million watts. This beam would be aimed by a perfect (10-meter diameter) mirror able to focus the beam on a spot with a diameter of less than a meter at a distance of 3,000 kilometers with an intensity sufficient to burn through the shell of a booster within about seven seconds.

The number of such battle stations required to destroy all the Soviet ICBMs—assuming that they were all launched at the same time—would depend upon a number of factors:

- the total number of Soviet ICBMs—assumed by the UCS group in their original March 1984 report to be the current number, 1,400;[3]
- the duration of the boost phase—assumed to be 100 seconds;
- the average distance between the battle-station and the booster—assumed to be 3,000 kilometers;
- the distribution of the silos—assumed to be the same as the current distribution;
- the distribution of the satellites in orbit—approximated as uniform; and
- the "slew-and-settle" time required to move the laser beam from one target to another—assumed to be zero.

Some of these assumptions were generous. For example,

*I discuss here only the debate over the UCS report because the public discussion has tended to focus on it. However, on May 8, 1984, Abrahamson distributed to the press a set of criticisms of the OTA report. This was followed, on June 4, by a letter from Deputy Secretary of Defense William H. Taft IV to OTA Director John Gibbons, demanding that the OTA withdraw Carter's report. The OTA issued a sharp rebuttal to Abrahamson's list of criticisms and, on July 13, after having the OTA report reviewed by three high-level defense experts, Gibbons turned down Taft's request. The Defense Department does not appear to have pursued the matter further.

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(Left to right) Hans A. Bethe, professor of physics emeritus at Cornell University and former chief of the theoretical division at Los Alamos National Laboratory; Richard L. Garwin, physicist and defense specialist at the IBM Thomas J. Watson Research Center; and Robert Jastrow, adjunct professor of earth sciences at Dartmouth College. *(Bethe photo by Sol Goldberg; Jastrow photo courtesy Dartmouth News Service)*

the Soviets could increase the number of their ICBMs or deploy relatively inexpensive decoys that would mimic ICBMs during their boost phase. They could concentrate their missile silos in a single area, thus minimizing the number of battle-stations within range at any one time. "Fast-burn" boosters could be developed that cut the duration of the boost phase to 50 seconds. And the slew-and-settle time required to focus a 10-meter diameter mirror on a moving booster 1,000 kilometers away would not be negligible.

However, approximations made in the original UCS calculations were decidedly ungenerous. Most significantly:

- the battle-satellites could be placed into orbits which would increase their relative density at the latitudes of the Soviet missile fields by a factor of almost three;
- as the density of the battle-satellites increased, the average distance between battle-satellites and targets would decrease.

Similarly crude approximations seem to have been made in the original Los Alamos calculations, and both groups quickly refined their work. By the time the UCS report appeared in book form and, in a shortened version, in *Scientific American* a few months later, *all* its key assumptions were generous to the Star Wars concept, and the estimated number of battle-satellites had been reduced to 300.

In a new analytical paper,[4] however, Garwin has highlighted this generosity by pointing out that, were the Soviet Union to deploy 3,000 small, 40-second burn-time boosters in a region of 1,000 kilometers or less in diameter, and if the slew-and-settle time of the laser mirror were as slow as one-half second, the calculated number of battle-satellites would spring to 1,500. The Soviets would thus be forcing the United States to deploy an extra billion-dollar satellite for every few million-dollar boosters which they deployed—hardly an advantageous exchange for the United States.

It should be emphasized that the hypothetical system being debated by the UCS group and its critics was not an officially proposed design. Although such specific designs have been proposed by small groups of Star Wars enthusiasts, the enormous $26 billion budget that has thus far been requested is only for the first five years of a 10-year exploratory research program.

In the absence of a specific design, the critics have had either to postulate their own—and run the risk of being criticized, as the UCS group was, for ungenerous assumptions—or offer criticisms that would apply to any space-based system. At this stage, the more general criticisms are much more important.

PERHAPS the most fundamental technical objection to any Star Wars system would be its susceptibility to countermeasures. Indeed, this point is at the core of the UCS-OTA critique of the Star Wars proposal—just as it was at the core of the Garwin-Bethe critique of the ABM system proposed 15 years ago. From this perspective, the attempts of Star Wars advocates to focus on the details of the earliest version of the UCS calculations of the number of battle-satellites in the absence of countermeasures must be seen as a diversion. McGeorge Bundy, George Kennan, Robert McNamara, and Gerard Smith have made this point particularly well: the "inevitable Soviet reaction is studiously neglected by Secretary Weinberger when he argues in defense of Star Wars that today's skeptics are as wrong as those who said we could never get to the moon. The effort to get to the moon was not complicated by the presence of an adversary. A platoon of hostile moon-men with axes could have made it a disaster."[5]

Consider, for example, the battle-satellites' vulnerability to attack. The Star Wars program puts much emphasis on such orbiting satellites because, after the boost phase, the deployment of multiple warheads and decoys could make the defense problem virtually impossible, and almost all boost-phase schemes require battle-satellites. (Only one

directed-energy beam weapon has been proposed that would be light enough to be "popped-up" into space *after* Soviet ICBM launch had been detected. This is the nuclear-explosion-powered X-ray laser. However, as both the UCS and OTA reports point out, the X-rays from this weapon could not penetrate far into the atmosphere and a "fast-burn" booster could be designed to release its warheads below this level.)

A fundamental weakness of all ballistic-missile-defense schemes involving orbiting battle-satellites is that the satellites would be much more vulnerable to attack than their targets. Unlike the boosters, which would be available for destruction for only about a minute at an unpredictable time, the battle-satellites would be at predictable locations in predictable orbits. These billion-dollar machines could therefore easily be destroyed by ground-based lasers or something as simple as a cloud of small metal pellets put into a counter-rotating orbit. (Because of their high closing-speed, such pellets would carry hundreds of times as much energy as an equivalent weight of bullets.) Of course, one could at great expense transport thousands of tons of armor to each battle station, but then how could the sensors see and the lasers fire? In any case, this example shows how one simple countermeasure could either incapacitate a battle station or greatly increase its complexity and cost.

Other countermeasures could neutralize a defensive system without destroying it. For example, Jastrow has proposed a relatively low-cost but easy-to-counter design in a recent article in the *New York Times Magazine,* written in collaboration with Zbigniew Brzezinski, President Carter's national security advisor, and Max Kampelman, President Reagan's new arms control negotiator.[6] The proposed scheme would involve two layers: the first would consist of 100 satellites each carrying 150 interceptor rockets similar to that currently being developed for the U.S. antisatellite system. Those few satellites within range would attack Soviet ballistic missiles during their boost phase. As the UCS group has pointed out, however, a "fast-burn" booster that completed its burn within the atmosphere would also be an effective countermeasure to this system. The infrared sensors of the homing interceptor warheads would be blinded by friction heat as soon as they entered the atmosphere. The second layer of Jastrow's proposed system would be made up of 5,000 ground-based rockets, each of which could intercept a warhead (or decoy) above the atmosphere as it approached its target.

At a political level, there are equally fundamental objections to the Star Wars proposal. Perhaps most importantly, whether or not any Star Wars system was intended to serve only defensive purposes, the other side would not see it as such. And, in fact, such a system makes much more sense as an adjunct to a first-strike capability than as a shield from a first strike. Because of its inevitable vulnerability, a Star Wars-type system would be fairly easy to neutralize at the beginning of a highly orchestrated first strike. But, in the face of a disorganized retaliatory strike by an unprepared *victim* of a surprise attack, it might be more effective. The Star Wars system would therefore tend to destabilize the balance of terror by increasing the advantages of a first strike. The fact that the Star Wars program has been launched at the same time that the United States is embarking on a huge buildup of exactly the types of accurate ballistic missile warheads that would be most useful in a first strike must be particularly disturbing to Soviet strategic analysts. Indeed, Yuri Andropov said as much four days after President Reagan's original Star Wars speech:

> The strategic offensive forces of the United States will continue to be developed and upgraded at full tilt and along quite a definite line at that, namely that of acquiring a first strike capability. Under these conditions the intention to secure itself the possibility of destroying with the help of ABM defenses the corresponding strategic systems of the other side, that is of rendering it unable of dealing a retaliatory strike, is a bid to disarm the Soviet Union in the face of the U.S. nuclear threat.[7]

The Soviet Union will do whatever is required to prevent the United States from rendering it incapable of launching a retaliatory strike. And, in view of the fact that only one percent or so of the current Soviet nuclear arsenal could obliterate U.S. urban society, the United States could not possibly unilaterally eliminate its mutual hostage relationship with the Soviet Union. The United States can, however, unilaterally launch a defense-offense arms race which, in addition to wasting the skills of tens of thousands of scientists and engineers, would induce enormous uncertainty and paranoia among worst-case analysts on both sides. Staving off such a defense-offense arms race was, of course, the major achievement of the 1972 ABM Treaty.

The debate over the credibility of the Star Wars critics therefore masks a much more important debate—between those who, knowingly or not, are attempting to launch a far more virulent new phase of the nuclear arms race and those who are trying to provide the insight that would allow the United States and the Soviet Union to avoid this danger. □

1. John Tirman, ed., *The Fallacy of Star Wars* (New York: Vintage Books, 1984), based on studies conducted by a group co-chaired by Richard L. Garwin, Kurt Gottfried, and Henry W. Kendall. See also the article-length version, Hans A. Bethe, Richard L. Garwin, Kurt Gottfried, and Henry W. Kendall, "Space-Based Ballistic-Missile Defense," *Scientific American* (Oct. 1984). Ashton Carter, *Directed Energy Missile Defense in Space* (Washington, D.C.: Office of Technology Assessment, 1984).

2. Richard L. Garwin and Hans A. Bethe, "Anti-Ballistic-Missile Systems," *Scientific American* (March 1968).

3. *Space-Based Missile Defense* (Cambridge, Massachusetts: Union of Concerned Scientists, March 1984).

4. "Missile-Killing Potential of Satellite Constellations," draft, Richard L. Garwin, Jan. 2, 1985.

5. McGeorge Bundy, George F. Kennan, Robert S. McNamara, and Gerard Smith, "The President's Choice: Star Wars or Arms Control," *Foreign Affairs* (Winter 1984), p. 264.

6. Zbigniew Brzezinski, Robert Jastrow, and Max M. Kampelman, "Search for Security: The Case for the Strategic Defense Initiative," *New York Times Magazine,* Jan. 27, 1985.

7. Sidney D. Drell, Phillip J. Farley, David Holloway, *The Reagan Strategic Defense Initiative: A Technical, Political, and Arms Control Assessment* (Stanford, California: Center for International Security and Arms Control, 1984), p. 105.

Paul Valerry, West Germany

U.S., Soviet programs threaten ABM Treaty

by Thomas K. Longstreth and John E. Pike

IN FEBRUARY 1985, the Reagan Administration released another report on Soviet noncompliance with arms agreements, the underlying theme of which was that Soviet efforts in a number of areas related to development and deployment of anti-ballistic-missile (ABM) systems indicate an intention to "break out" of the 1972 ABM Treaty and deploy a nationwide territorial defense against ballistic missiles. In his accompanying letter to Congress, President Reagan spoke of the need to "reverse the erosion of the ABM Treaty" and emphasized that this would be a U.S. objective at the "umbrella" arms negotiations in Geneva.

The ABM Treaty is indeed now threatened. But the threat stems not only from Soviet noncompliance but also from a whole range of Soviet and U.S. weapons development activities which circumvent the Treaty. These activities, both near- and long-term, will destroy the viability of the agreement if immediate steps are not taken to prevent it from happening.

There is a strong interrelationship between Treaty "erosion" and developments in antimissile weapon technologies. While the Administration has been more than willing to use alleged Soviet noncompliance as an excuse to explain away a flawed arms control approach and justify the multi-billion dollar Strategic Defense Initiative or "Star Wars" program, it has so far been unable or unwilling to discuss possible solutions to present difficulties that might preserve the ABM Treaty and help the nuclear arms control process to survive.

THE STRATEGIC defense initiative poses one of the most direct threats to the ABM Treaty. Long before any decision is made on whether or not to deploy a missile-defense system—if one is feasible—certain aspects of the Star Wars program will encounter Treaty limits. Of greatest potential impact are a number of tests and demonstrations, scheduled to take place in the next four to eight years, of ABM-related components, including advanced sensors and interceptors.

In 1989–1990, the first flight of the Airborne Optical System (AOS) is planned. The AOS is a modified Boeing 767 aircraft that carries a pair of infrared telescopes for tracking

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and identifying reentry vehicles while they are still above the atmosphere for interception by midcourse and terminal defenses. This system has been under development for several years and was originally scheduled to be flight-tested in 1987. Upgrades to its performance requirements have delayed this test by at least two years.

The Space Surveillance and Tracking System (SSTS) will use cryogenically cooled infrared sensors to detect and track warheads and decoys during the midcourse of their flight. In a layered defense, SSTS, along with other sensors, would provide target tracking and identification information which would be relayed for use by midcourse interceptors.

The Space-Based Laser Project includes the Talon Gold pointing and tracking component, a large telescope attached to a space-based laser to insure that it is properly aimed at the target. Talon Gold was scheduled to be tested aboard the space shuttle in mid-1987 or 1988. As a result of budget cuts and Administration decisions, the Talon Gold program has been restructured. Initial tests of its hardware will be conducted on the ground. A new, more capable system will be developed, under a new program name, with the first space flight-test scheduled for the early 1990s. A full-scale integrated orbital demonstration of the entire Space-Based Laser is possible by the early 1990s.

The advanced development and flight testing of AOS, SSTS, or the follow-on to Talon Gold would appear to be inconsistent with the provision in Article V(1) of the ABM Treaty banning the development, testing, or deployment of air-based or space-based ABM systems or components.

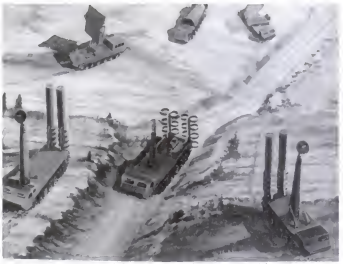
A MAJOR THREAT to the Treaty also results from efforts in weapon technologies that, while ostensibly designed for other purposes, have applications for missile defense. The three most difficult such "gray area" developments are antisatellite weapons (ASATs), anti-tactical-ballistic missiles (ATBMs), and large phased-array radars (LPARs).

Antisatellite weapons. The technologies and components necessary to destroy satellites and ballistic missiles overlap considerably. Because the ABM Treaty does not explicitly limit ASATs, many of the technologies for ballistic-missile defense, including sophisticated sensing, tracking, and nonnuclear kill devices, could be tested and deployed under the guise of ASAT systems.

Anti-tactical-ballistic missiles. Modern air-defense systems often rely on high velocity surface-to-air (SAM) interceptor missiles to destroy enemy aircraft. These systems also have some capability against medium- and intermediate-range ballistic missiles, a capability that is growing with each new generation of interceptors and radars. Such weapons are called anti-tactical-ballistic missiles.

Systems with an ATBM capability, however, might also be effective against certain kinds of strategic missiles, especially submarine-launched ballistic missiles (SLBMs), if they fly at a similar speed, flight trajectory, and reentry angle to land-based, medium-range tactical ballistic missiles.

The unconstrained development and deployment of ATBMs by both the United States and the Soviet Union



The Soviet SA-X-12 air defense system. The anti-tactical-ballistic missiles are fired from mobile launchers, accompanied by reload vehicles and supported by target-tracking and fire-control radars. *(Artist's rendering courtesy Department of Defense)*

threaten to circumvent the purpose of the ABM Treaty. The application of such weapons to a strategic ABM role appears quite likely over the long term if specific limits on their testing and deployment are not agreed upon soon.

The problem has become more serious in recent years as the United States and the Soviet Union have begun deploying their latest generation of air-defense systems. The most notable Soviet ATBM is the SA-12 system, now under development and limited deployment. The SA-12 is a high-performance, hypersonic surface-to-air missile capable of executing high-speed maneuvers to attack targets at altitudes above 100,000 feet.

Most U.S. ATBM work over the last decade has focused on upgrading the Patriot anti-aircraft system now being deployed in West Germany and the United States. Enhancements to Patriot's radars and battle-management computers, as well as upgrades to the missiles themselves, could have provided a limited ATBM capability for the late 1980s. However, upgrading Patriot to an ATBM has been shelved.

Much of the U.S. ATBM effort is now concentrated in the Strategic Defense Initative (SDI) or "Star Wars" program, where the small-radar and extended-range homing intercept technologies appear intended to support ATBM applications. Eventually, programs that are part of the SDI's terminal system demonstration could also be used as ATBMs.

Article VI(a) of the ABM Treaty bans upgrading air-defense and other non-ABM systems and components to give them an ABM capability. It prohibits either party from giving non-ABM systems the capability "to counter strategic ballistic missiles or their elements (reentry vehicles) in flight trajectory" or from testing them "in an ABM mode."

Although not included in the unclassified February noncompliance report, Soviet SA-12 activities have aroused Administration concern. Reportedly, the SA-12 has been tested against a target vehicle derived from an SS-4 intermediate-range ballistic missile. At issue is whether such activity could be considered a violation of Article VI(a).

An agreed statement clarifying, among other things, what

would constitute testing "in an ABM mode" was reached in the Standing Consultative Commission (SCC) in 1978, but it remains classified. (The SCC was established by the ABM Treaty to implement the agreement and to clarify any compliance questions that arise.)

Some Administration officials believe that the SA-12 would be considered "tested in an ABM mode" if it were to attack a target vehicle whose flight trajectory was that of a strategic ballistic missile. Soviet SS-N-5 and SS-N-6 SLBMs, which are limited by the SALT I agreement and thus considered strategic ballistic missiles, have flight trajectories similar to the SS-4. Therefore, some Administration officials argue that, if the SA-12 interceptor has been tested against a target based on the SS-4, such activity is inconsistent with Article VI(a). Other senior defense officials, however, have drawn different conclusions. Franklin Miller, the Pentagon's director for strategic forces policy, stated in 1984 testimony before the Senate Armed Services Committee: "The Soviet System, SA-X-12 . . . is an air defense system which has an anti-tactical ballistic missile capability. There is nothing in its development that contravenes the ABM Treaty because that treaty deals with strategic anti-ballistic missile systems."

The February report did discuss a related issue, stating that: "The Soviet Union has conducted tests that have involved air defense radars in ABM-related activities. The number of incidents of concurrent operation of SAM and ABM components indicate the U.S.S.R. probably has violated the prohibition on testing SAM components in an ABM mode."

The controversy over Soviet operation of air-defense radars at or near ABM test ranges during tests of ABM components has raged for over a decade and originally concerned Soviet practices with the SA-5 air-defense system. Although there is considerable disagreement over what would constitute a violation of Article VI(a) of the ABM Treaty, during negotiation of the Treaty the two delegations reached a common understanding that SAM radars "used for range safety and instrumentation purposes may be located outside of ABM test ranges." The Soviets also emphasized at the time that non-ABM radars for range safety or instrumentation were not limited under the Treaty. In the SCC's 1978 statement the two sides also clarified permissible uses of radars in conjunction with ABM tests. At issue is whether operation of SAM radars at or near the Sary Shagan test range contravenes Article VI or the 1978 SCC agreed statement.

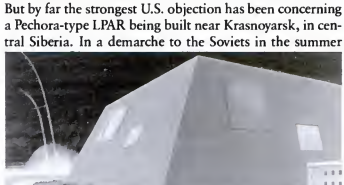
Large phased-array radars. These radars detect and keep track of objects without the moving parts used by older, mechanically steered radars. A phased-array radar's thousands of small transmitters steer its signal toward objects in its field of view, giving it the capability to track thousands of small, rapidly moving objects simultaneously and accurately. LPARs provide early warning of missile or bomber attack, track satellites and other space objects, and observe missile tests for monitoring purposes. They are also an essential component of current ABM systems, providing initial warning of attack and battle-management support, distinguishing reentry vehicles from decoys, and guiding interceptors to their targets.

During the negotiation of the ABM Treaty, it was recognized that establishing useful restrictions on radars would be extremely difficult. The United States was very concerned about the ABM potential of certain Soviet radars and sought strict limitations in this area. The Soviets were reluctant to agree to any limits that might interfere with their large air-defense system with its many radars designed to track enemy aircraft. After extensive discussions, the two sides agreed to some limits on ABM and other types of large radars. The widespread introduction of phased-array radars by both sides since 1972, however, has made the problem more acute.

The Treaty, recognizing that LPARs can be used for tracking satellites, early warning, and arms control verification, made allowance for such activities. But the Treaty also recognized that LPARs had to be restricted because of their importance to any ABM system. Because of their size and complexity, LPARs take years to construct and are, therefore, the main "long lead-time" item for an ABM system.

Article VI(b) of the ABM Treaty states that "Each Party undertakes . . . not to deploy in the future radars for early warning of strategic ballistic missile attack except in locations along the periphery and oriented outward." Thus, the Treaty limited the ability of early warning radars to function as ABM radars by restricting them, geographically, to vulnerable locations along a nation's periphery. Agreed Statement F of the Treaty provides an exemption from this limitation for radars "for the purposes of tracking objects in outer space or for use as national technical means of verification." Unfortunately, an LPAR designed for one of these functions can be used for others, given its versatility.

During the 1970s, the Soviets began to construct a network of early-warning LPARs, known as the Pechora-type. Six of these have now been initiated or completed, and they provide almost complete coverage of potential incoming missile attack trajectories. The United States first raised questions about these radars in the SCC in the late 1970s. But by far the strongest U.S. objection has been concerning a Pechora-type LPAR being built near Krasnoyarsk, in central Siberia. In a demarche to the Soviets in the summer



The Poshinko radar, one of six Soviet large phased-array radars (LPARs) now in place or under construction. The placement of at least one Soviet LPAR has led to U.S. charges that the multiple-use tracking devices are part of an ABM system, rather than primarily for use in space tracking and verification. *(Artist's rendering courtesy Department of Defense)*

of 1983, and in subsequent SCC sessions, the United States has questioned the Krasnoyarsk radar's conformity with Article VI(b) because it was assessed to be an early-warning radar not located along the periphery or oriented outward.

The Soviets claim that the Krasnoyarsk radar is designed, located, and oriented primarily for purposes of space tracking and verification and is therefore excluded from Article VI's limits by way of Agreed Statement F. The United States has continued to object strongly to this radar facility, most recently in the February noncompliance report, which cited it as a clear violation.

Seldom mentioned in discussions about the Krasnoyarsk radar is the fact that the Soviets could increase the ABM battle management potential of their radar network by deploying additional Pechora-type radars in a manner fully consistent with the Treaty. The main problem is not the Krasnoyarsk radar itself, but the potential of LPARs for undermining the Treaty.

The Soviets have raised analogous questions about U.S. radars. In 1978, they questioned in the SCC whether two U.S. Pave Paws LPARs were consistent with the undertaking in Article I of the ABM Treaty "not to provide a base" for ABM territorial defense. These radars, primarily designed for early warning of SLBM attack and for space tracking, were deployed in Massachusetts and California. Since then, construction has begun on two other Pave Paws radar facilities in Georgia and Texas, about which the Soviets have also complained.

The Pave Paws radars provide a 240-degree field of coverage to a range of 3,000 miles. Initial plans for deployment of the two new sites resulted in a field of coverage that included almost two-thirds of the continental United States. The final deployment plan apparently reduced this significantly, but it still includes greater portions of the country than were covered by the first two Pave Paws sites. They are also located further inland than the first two sites. Hence, the Soviets may not only claim that they are inconsistent with Article I, but also with Article VI(b).

The Soviets have aired other complaints about U.S. LPARs. In 1975, they expressed concern that the U.S. Cobra Dane LPAR under construction on Shemya Island, Alaska, was an ABM radar prohibited by Article III of the Treaty because it was outside agreed ABM test ranges or deployment areas. The United States explained that the radar was for verification purposes, space tracking, and early warning. The United States then believed that Soviet concerns had been alleviated, but the Soviet Union has raised Cobra Dane repeatedly in public accounts of alleged U.S. Treaty violations.

Another U.S. LPAR issue looms over the horizon. The United States is now upgrading the existing Ballistic Missile Early Warning System (BMEWS) by replacing older, fixed-array and mechanically steered radars with new phased-array radars similar to Pave Paws. The process is nearly complete at Thule, Greenland. The Fylingdale Moors site in the United Kingdom will be upgraded in the next several years with a three-faced, 360-degree-coverage LPAR. A new radar for the third BMEWS site at Clear, Alaska, is also under consideration. All three sites are receiving new computer hardware and software to improve their missile attack assessment.

The Soviets will undoubtedly question whether—in combination with the Pave Paws sites, the Cobra Dane and Cobra Judy LPARs, the perimeter acquisition radar in South Dakota, and other radars and sensors—the United States is building a base for ABM territorial defense that would be inconsistent with Article I.

OTHER SOVIET ABM activities, some cited in the Administration's report, may be inconsistent with the ABM Treaty, for example, the possibility of a new mobile ABM system. Various Soviet practices with respect to deployment of their new ABM-X-3 system led the United States to examine whether the Soviets were developing a mobile, land-based ABM system or components contrary to the provisions of Article VI(1). Specifically, the Soviets have developed and tested a modular radar that can be erected on a prepared site in a matter of months. This "Flat Twin" radar is similar to the U.S. Site Defense Radar developed in the early 1970s. Several of these radars are under construction as part of the upgrade of the Moscow system to the ABM-X-3 configuration.

The October 1984 report of the Arms Control and Disarmament Agency's General Advisory Committee (GAC) on Soviet noncompliance argued that the Flat Twin is not of a "permanent, fixed type" and is therefore a mobile ABM radar banned by Article V. The February report acknowledged Soviet actions with respect to ABM component mobility as "ambiguous" but said they "represent a potential violation" of the Treaty.

One of the principal purposes of the ABM Treaty is to constrain the ABM capabilities of the parties to such low levels that neither would have to make compensating and offsetting increases in offensive forces. This was codified in the Article I undertaking "not to deploy ABM systems for a defense of the territory . . . and not to provide a base for such a defense."

The Administration is attempting to buttress its case against the Soviets by arguing that, when viewed in the aggregate, Soviet ABM-related activities suggest that the Soviet Union may be preparing to "break out" of the ABM Treaty. The facts, however, do not support this case.

Possible Soviet motivations for abandoning the ABM Treaty are obscure. The technology of their new ABM-X-3 system, for example, is analogous to that of the U.S. Safeguard/Sentinel of the 1960s. Such a system would be of questionable utility when faced with the U.S. missile threat of the 1990s. While the Soviets have a hedge against uncertainty in their development program, the fruits of that effort do not provide incentive for doing away with the ABM Treaty regime. Nevertheless, if they become convinced that the United States intends to abrogate the Treaty at a time of its choosing, the Soviets might decide to preempt the U.S. initiative and soften its impact with a deployment of their own.

CONSTRUCTIVE policies aimed at stopping and reversing treaty erosion are required. A series of reports publicizing alleged Soviet infractions, most of which are highly questionable and of marginal military significance does not constitute such an approach. If the viability of the ABM Treaty is to be preserved, both superpowers will have to take immediate collaborative steps to assure its continuation. To date, the approach of each nation has been to assert that its own antimissile programs are consistent with the ABM Treaty while accusing the other of preparing to break out of the agreement.

In determining what measures will help to reverse erosion of the Treaty, it must be remembered that prohibitions which limit one side must necessarily limit analogous activities on the other. If one side presses the Treaty's limits by demanding freedom of action, the other side will seek equal rights. Also to be borne in mind is that the SCC, created by the Treaty to serve as a mechanism for resolving compliance and implementation issues, is the logical forum within which to reach further clarifications. The SCC was intended to be, and could still become, the main avenue for resolving issues in order to preserve and strengthen the Treaty.

The Reagan Administration has taken actions that impair the usefulness of the SCC while saying that its past effectiveness has been exaggerated. Many other informed experts and former officials disagree; they believe that the SCC has helped on many occasions to work out mutually acceptable solutions to Treaty implementation problems and ambiguities.

Former SCC member Robert Buchheim has written: "The essence of the SCC . . . is to head off potential gross dislocations or irretrievable circumstances by acting early enough and finding mutually acceptable clarifications and implementing understandings, as well as inducing unilateral changes in troublesome activities, to sustain intact the agreements." Both Buchheim and the only other previous U.S. commissioner, Sidney Graybeal, have maintained that the SCC has demonstrated its utility and effectiveness over the last decade.

The SCC should be utilized, wherever possible and needed, to reach agreed interpretations to further clarify and strengthen Treaty limits. A number of specific actions would help to alleviate problems created by technological innovation and "gray area" weapons developments:

- An agreement limiting further testing, development, and deployment of ASATs would help to prevent the undermining of the ABM Treaty. Because both directed- and kinetic-energy weapons now under development by both sides could be used for ASAT and ABM purposes, they should be strictly limited.

While it is beyond the scope of this article to discuss the details of how such a treaty might be drafted, the most important limitation in any ASAT treaty would be a prohibition on testing "dedicated" ASATs. A prohibition on deployment of any dedicated ASAT system, while it might pose greater verification difficulties, would also be in the net security interest of the United States.

- The parties could agree not to deploy powerful mobile or transportable land-based radars, or not to test such radars against targets which have the characteristics of strategic ballistic missiles.
- The parties could agree not to construct any new LPAR, for any purpose. The standstill could either permit or prohibit the completion of radars currently under construction, such as the Soviet radar at Krasnoyarsk or the four new U.S. Pave Paws and BMEWs radars.

Alternatively, the parties could agree that each would be permitted no more than a certain number of LPAR transmitter faces. At present, the United States has seven such faces, with an additional six under construction and another four planned, for a total deployment of 12 to 15 faces. The Soviets have approximately nine operational LPAR faces, with another two or three under construction, for a total deployment of 11 to 12. Soviet LPARs are typically more powerful than U.S. radars, but the United States has better computation capabilities.

The parties could agree not to deploy in the future any LPARs, except permitted early warning or ABM radars. This would prohibit new LPARs for space tracking or verification, except to the extent that such deployments were consistent with treaty limits on early warning radars.

- Other longer-term ABM issues will also have to be addressed. The SDI, for example, includes tests of ABM systems and components in the late 1980s and early 1990s that would appear to be inconsistent with the ABM Treaty. The Soviets also are reportedly working on advanced ABM systems. The United States and the Soviet Union could reach understandings well before any tests take place to clarify permitted and prohibited activities. For example, an understanding could be reached on ABM components that would clarify those devices capable of partially substituting for existing types of ABM components. This could include prior notification, with data exchanges, of any testing of components considered to be less than fully applicable to ABM purposes.

The parties could agree not to test fixed types of long-range (exoatmospheric) ABM interceptors. Testing and limited deployment of such systems is presently permitted under the Treaty, but their development and deployment fuel concerns about preparing a base for territorial defense. Such a restriction could permit the testing and deployment of fixed, land-based, short-range (endoatmospheric) ABM interceptors which are more applicable to the defense of ICBM silos and pose a less serious threat to stability.

The parties also could agree to prohibit the testing of any directed-energy device, regardless of how based, which had a potential brightness beyond a certain level.

This is only an illustrative list of some steps that could be undertaken to strengthen the ABM Treaty regime. If the Reagan Administration is serious about reversing the erosion of the ABM Treaty, it should demonstrate its seriousness by immediately beginning to suggest remedies. □

U.S. coverup of Nazi scientists

"Paperclip" was a U.S. project to employ German scientists in sensitive military and space programs after World War II. This investigation reveals that evidence of Nazi activism and war crimes was suppressed in order to allow many of them to immigrate.

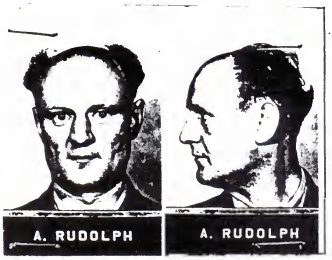
by Linda Hunt

THE U.S. JUSTICE Department announced last October that Arthur Rudolph, who designed the Saturn 5 rocket that took astronauts to the moon in 1969, had relinquished his citizenship and left the United States rather than contest charges that he had committed war crimes in Nazi Germany. The Department's Office of Special Investigations (OSI) had found "irrefutable" evidence of Rudolph's "complicity in the abuse and persecution of concentration camp inmates who were employed by the thousands as slave laborers under his direct supervision," according to Eli Rosenbaum, the former OSI prosecutor who supervised the Rudolph case.

During World War II, Rudolph was operations director for V-2 missile production at the underground Mittelwerk factory which was part of the Dora-Nordhausen concentration camp complex in Germany. Evidence presented at a U.S. Army trial at Dachau, West Germany in 1947 disclosed that 20,000 Camp Dora prisoners had died after being starved, beaten, hanged, or overworked.[1]

The Justice Department's move against Rudolph is the first time that its OSI unit, established in 1979 to investigate and sue to deport Nazi war criminals, has challenged a scientist brought to the United States under a special project at the end of the war. The project, originally codenamed "Overcast" and then changed to "Paperclip" in 1946, was designed to exploit the expertise of German and Austrian scientists and prevent the remilitarization of Germany. As the Cold War later heightened, the project was also used to deny the services of these specialists to the Soviet Union and other countries. Between 1945 and 1955, 765 scientists, engineers, technicians, and other specialists were hired by the United States under this program.

The prevailing interpretation of Project Paperclip—a view not contradicted by information made public about the Rudolph case—is that only a handful of war criminals or active Nazis accidentally slipped past the watchful eyes of the officials who ran the program. This interpretation has been perpetuated by the only book on the subject, published in 1971, written without access to many records and, as author Clarence Lasby noted, "cleared" by the Pentagon prior to publication.[2]



Photographs from Arthur Rudolph's Basic Personnel Record in the U.S. Army's files.

But secret personnel files obtained by this reporter under the Freedom of Information Act during the past 18 months reveal a different story about the past lives of some German scientists and the actions and motives of top U.S. officials who ran the program. These and other formerly classified documents reveal details of the U.S. military's employment of alleged Nazi war criminals in highly sensitive defense projects. They show that government officials concealed information about many specialists in order to secure their legal U.S. immigration status. The coverup seems to have stemmed from a belief that U.S. national security would be best served by keeping these Nazi specialists away from the Soviet Union. But it was a direct contravention of the presidential directive which formally set up Project Paperclip.[3]

The program to exploit German and Austrian specialists grew from the notion that they were part of the spoils of the war which had been won against Nazi Germany. Beginning in 1945, special units of American scientists and military personnel tracked down Nazi experts in rocketry, aircraft design, aviation medicine, and other fields and the

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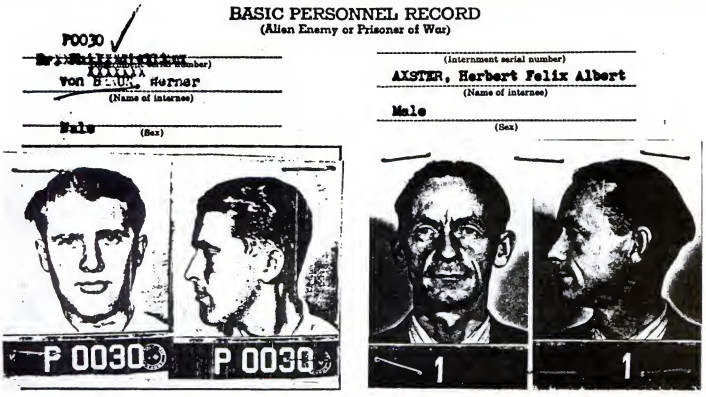

Photographs from Wernher von Braun's (left) and Herbert Axster's Basic Personnel Records.

scientific papers and equipment in their possession. Under the secret Overcast mission, some specialists were brought to the United States under military custody to be exploited to U.S. advantage. They included experts on V-2 missiles (including Wernher von Braun), aircraft design, wind tunnels, and other fields. The project originated to use their skills temporarily, and then these enemy aliens were to be returned to Germany.

But by early 1946, the War Department found their skills too valuable to lose and pushed for a revised program that would allow them to stay in the United States. Their technological know-how was seen as vital for U.S. military projects.[4] On March 4, 1946, the State-War-Navy Coordinating Committee drafted a policy that contained a process for legal immigration approval and long-term contracts for the specialists. A special policy was required because immigration and other laws forbade legal entry to members of fascist organizations or those who had opposed U.S. war efforts. The new project, Paperclip, absorbed the original Overcast group and brought others to the United States. President Harry S. Truman signed the policy on September 6, 1946.[5]

Paperclip policy forbade utilization of war criminals or those active in Nazism. The policy states in part: "No person found by the Commanding General, USFET [U.S. Forces European Theater], to have been a member of the Nazi Party and more than a nominal participant in its activities, or an active supporter of Nazism or militarism shall be brought to the U.S. hereunder."[6] The policy recognized that "neither position nor honors awarded a specialist under the Nazi Regime solely on account of his scientific or technical abilities" would disqualify him. Still, the positions of esteem they had held in Nazi Germany meant that many had also played by Adolf Hitler's rules.

BY 1947, THE MILITARY and industry, through the Commerce Department, employed nearly 400 German and Austrian scientists and technicians under Paperclip. The specialists were under military custody until the Departments of State and Justice approved immigration and they reentered the United States as legal immigrants. Many of these specialists knew as much about U.S. defense systems as those they had worked on in Nazi Germany. Army Ordnance gave rocket specialists access to classified information almost from the day they arrived. Others worked on jet aircraft, torpedos, bombs, and other highly secret defense projects. These specialists also were increasingly seen by U.S. officials as assets in the Cold War. To the War Department, communism, not Nazism, was the threat to national security, and the military was determined to keep the Paperclip specialists in the United States.

Paperclip policy required the War Department to conduct background investigations of specialists' wartime Nazi activities. The Joint Intelligence Objectives Agency (JIOA), the agency under the Joint Chiefs of Staff in charge of Paperclip, received the results of those investigations. Some reports disclosed that specialists may have participated in experiments on humans, brutalized slave labor, and committed other crimes. One specialist was accused of conducting experiments on humans at an institute in Prague; another's name was on an Army war crimes list as being wanted for murder. Many had been early members of the Nazi Par-

ty, the SS (Schutz Staffel—the elite security forces led by Heinrich Himmler), or the SA (Sturm Abteilung—storm troopers).

On February 26, 1947, JIOA Director Bosquet Wev submitted the first specialists' dossiers to the Departments of State and Justice for immigration consideration. Since the dossiers did not contain raw investigative reports, the key document included in each dossier was a security report filed by the Office of Military Government U.S. (OMGUS) that summarized investigations of war crimes or membership in Nazi organizations. Of primary concern to the State Department was OMGUS's judgment of whether the individual was an "ardent Nazi," and thus a security threat to the United States.[7]

To obtain legal immigration status, the JIOA had to get these reports past the State Department representative on JIOA's governing board, Samuel Klaus, who had pressed the War Department to conduct more thorough background investigations. Klaus believed that Nazis were a threat to U.S. security, and to give them legal immigration status violated Paperclip policy.[8]

Klaus and other State officials had seen some incriminating reports and also suspected that many specialists had lied about their Nazi backgrounds. During a May 26, 1947 meeting with the JIOA, one State official "hit the ceiling" after finding discrepancies between OMGUS reports and the specialists' statements concerning Nazi organization memberships.[9]

By July 2, 1947, the State Department and the JIOA were deadlocked in an angry battle over immigration. State balked at approving visas for the few applications submitted thus far, in part because OMGUS had judged them security threats. In a scathing secret memo, JIOA Director Wev warned that to return the scientists to Germany, where they could be used by potential enemies, "presents a far greater security threat to this country than any former Nazi affiliations which they may have had or even any Nazi sympathies that they may still have." Wev told Maj. Gen. S.J. Chamberlin, the director of intelligence, War Department General Staff, that State officials were "sabotaging by delay" the immigration procedure by focusing on the security issue and that it was imperative "that the most positive and drastic action possible be taken in order to break the impasse which currently exists."[10]

Maj. Gen. Walter Dornberger (left), commander of the Peenemünde missile base, with Lt. Col. Herbert Axster, Wernher von Braun (with sling), and Hans Lindenberg after they surrendered to U.S. Seventh Army troops May 3, 1945. Dornberger was contracted by the U.S. Air Force and Axster, von Braun, and Lindenberg by Army Ordnance under Paperclip. *(courtesy U.S. Army Signal Corps, DAVA)*

THE SOLUTION was very simple. If State would not approve immigration due to derogatory OMGUS reports, the JIOA would change the reports. On November 18, 1947, JIOA Deputy Director Walter Rozamus sent a memo to Intelligence Division General Staff Army advising the Army to withhold dossiers that contained incriminating information. Rozamus enclosed seven dossiers of individuals whose *OMGUS Security Report* classified them as "wanted for denazification" and warned: "It is not considered advisable to submit any of the enclosed dossiers to the Departments of State and Justice at this time." Wernher von Braun's dossier was one of those enclosed. Rozamus said von Braun's *OMGUS Security Report* "indicates that he is regarded as a potential security threat to the United States and he will be wanted for denazification trial in view of his party membership."[11]

Ten days later, the JIOA sent three more incriminating dossiers to Navy Intelligence and said they intended to ask European Command to "reevaluate" the OMGUS reports to revise the "ardent Nazi" classification. JIOA's deputy director noted that Paperclip policy excluded ardent Nazis and told Navy there was "little likelihood" the Germans could immigrate "if the Theater Security Reports are forwarded to the State Department in their present form."[12]

In a secret memo to European Command, on December 4, 1947, the JIOA asked that OMGUS reports of 14 individuals, including von Braun's, "be reviewed and that new security reports be submitted where such action is deemed appropriate." JIOA Director Wev made it clear that there was "little possibility" State or Justice would approve immigration for specialists deemed "potential or actual" security threats. "This may result in the return to Germany of specialists whose skill and knowledge should be denied other nations in the interest of national security." Army

sources quoted in the memo said OMGUS reports were "unrealistic" since "none of the subject specialists is described as politically active."[13]

JIOA files reveal that one of the individuals in question had been arrested by Army Counter Intelligence Corps agents in 1946 as a war crimes suspect but was not charged. There was evidence that two had mistreated slave labor. Most had been long-time Nazi Party members; three were in the SS, one in an SS Deaths Head unit; four in the SA; and most had belonged to other Nazi organizations.

Following that memo, all 14 reports were changed. Originally, von Braun's September 18, 1947 report had read in part: "He was an SS officer but no information is available to indicate that he was an ardent Nazi. Subject is regarded as a potential security threat by the Military Governor."[14]

But five months later, OMGUS issued a new report that changed the security threat classification: "The extent of his Party participation cannot be determined in this Theater. Like the majority of members, he may have been a mere opportunist." OMGUS noted that von Braun had been in the United States more than two years and that, if his conduct had been exemplary, "he may not constitute a security threat to the U.S." The report showed von Braun had joined the Nazi Party in 1937, and was a major in the SS and a member of four other Nazi organizations.[15]

Herbert Axster, wartime chief of staff to General Walter Dornberger at the Peenemünde missile base on the Baltic Sea, was also on the list. Axster's September 18, 1947 OMGUS report stated: "He should—ideologically speaking—be considered a potential security threat to the United States."[16] Six months later, OMGUS concluded an investigation based on a March 25, 1948 intelligence agent's report of interviews with Axster's wartime neighbors and affidavits of his acquaintances. Witnesses said that Axster had beaten and starved foreign slave labor on his two estates. In one instance, Axster had hit a Frenchman caught laying rabbit traps. Villagers told the agent that the man was probably hungry since the workers frequently begged for food from the townspeople. The report made clear that villagers were outraged that Axster's wife had escaped trial, by denazification court, as a major offender because she was in the United States. As a notorious leader of NS Frauenshafr, a women's Nazi Party auxiliary, witnesses said she beat workers and made pro-Nazi speeches.[17]

Despite the damaging evidence in that investigation, OMGUS changed the report to conclude: "Subject was not a war criminal and was not an ardent Nazi. The record of Herbert Axster as an individual is reasonably clear and as such, it is believed that he constitutes no more of a security threat than do the other Germans who have come to the U.S. with clear records in entirety." OMGUS said Axster was influenced by his wife, who was "gullible" to Nazism, but if his conduct in the United States was exemplary, "he might not constitute a security threat to the U.S."[18]

As a result of this cover-up, the War Department, in direct defiance of Paperclip policy, eventually obtained legal im-

Wernher von Braun's security report: before and after

Security evaluation from Wernher von Braun's September 18, 1947 report:

Based on available records, subject is not a war criminal. He was an SS officer but no information is available to indicate that he was an ardent Nazi. Subject is regarded as a potential security threat by the Military Governor, Office of Military Government for the U.S. [OMGUS]. A complete background investigation could not be obtained because subject was evacuated from the Russian Zone of Germany.

Letter from Bosquet Wev, JIOA director, to the European Command director of intelligence, December 4, 1947:

1. OMGUS security reports recently forwarded from your headquarters classify (14) specialists [including Herbert Axster and Wernher von Braun] as potential or actual threats to the security of the United States....
3. There is very little possibility that the State and Justice Departments will agree to immigrate any specialist who has been classified as a potential or actual security threat to the United States. This may result in the return to Germany of specialists whose skill and knowledge should be denied other nations in the interest of national security....
4. It is requested that the cases of the specialists listed in paragraph one be reviewed and that new security reports be submitted where such action is deemed appropriate in view of the information submitted in this letter.

Security evaluation from von Braun's February 26, 1948 report:

Further investigation of Subject is not feasible due to the fact that his former place of residence is in the Russian Zone where U.S. investigations are not possible. No derogatory information is available on the subject individual except NSDAP records, which indicate that he was a member of the Party from 1 May 1937 and was also a Major in the SS, which appears to have been an honorary commission. The extent of his Party participation cannot be determined in this Theater. Like the majority of members, he may have been a mere opportunist. Subject has been in the United States more than two years and if, within this period, his conduct has been exemplary and he has committed no acts adverse to the interests of the United States, it is the opinion of the Military Governor, OMGUS, that he may not constitute a security threat to the United States.

migration status for specialists suspected of war crimes. Of more than 130 incriminating OMGUS reports examined thus far by this author, all had been changed to eliminate the security threat classification.

IN ADDITION to this deception, a second pattern emerges from Paperclip records. Some forms the JIOA gave the State Department for specialists with extremely damaging information in their backgrounds were "clean" from the start. Among those found in this category are Arthur Rudolph and two defendants charged in a major war crimes trial with conducting experiments on humans.

OMGUS stated in two reports that Rudolph was "not an ardent Nazi" despite his early (June 1, 1931) Nazi Party membership—a factor that had caused others to receive negative reports—and despite a 1945 U.S. military appraisal of Rudolph that concluded: "100% NAZI, dangerous type, security threat. . . ! ! *Suggest internment.*" On December 8, 1948, the JIOA signed the final form for Rudolph's dossier before it was sent to State. The *Security Certificate* certified that the JIOA had checked all records and found "nothing in his records indicating that he was a war criminal, an ardent Nazi or otherwise objectionable" for immigration.[19]

When Rudolph's form was signed, the Army had evidence in its own records of war crimes committed against inmates of the Dora concentration camp which provided slave labor to the V-2 rocket factory where he and some other specialists worked. This evidence—presented at a 1947 war crimes trial, *U.S. Army v. Kurt Andrae et al.*—not only implicates Rudolph, it also dispels a myth which one Dora survivor calls a "monstrous distortion of history" about the factory.[20]

Over the years, scientists such as von Braun, who regularly visited the factory, sought to distance themselves from the unspeakable horrors perpetrated on the slave laborers, while others never hinted that their fantastic weapons were built by concentration camp inmates.[21] Even Albert Speer, the Nazi armaments minister, was more honest than the scientists about the true nature of the factory. After a visit, he described conditions there as "barbarous" and wrote in his memoirs that the men accompanying him "were so affected that they had to be forcibly sent off on vacations to restore their nerves."[22]

But the truth about Dora appeared in the largely overlooked 1947 trial. Evidence showed that the Dora camp existed for the primary purpose of providing slave labor for the Mittelwerk factory. The prisoners worked in the factory alongside the German missile technicians and were beaten by German "civilians" and hanged in full view of them. (The horrors of Dora also were documented in a U.S. Signal Corps film showing American soldiers in tears and outrage as they care for the few starving survivors and bury the 2,000 bodies left by the German civilians and SS members as they fled the advancing Allied forces.)[23]

The specific Army evidence regarding Rudolph was linked to trial defendant Georg Rickhey, the Mittelwerk general director who also had been hired under Paperclip. Rickhey was brought to the United States on July 4, 1946 and worked for the Army Air Forces for nearly a year while being investigated for war crimes. The charges stemmed from an October 17, 1946 letter written by Paperclip recruit Herman Nehlson that claimed Rickhey was the "chief culprit" when 12 foreign workers were hanged at Mittelwerk. He was arrested and returned to Germany to stand trial in the Army's Camp Dora case.[24]

"Beating a dead Nazi horse"

Memorandum from Bosquet Wev, director of the Joint Intelligence Objectives Agency, to Maj. Gen. S. J. Chamberlin, director of intelligence, War Department General Staff, July 2, 1947.

. . . [T]he best interests of the United States have been subjugated to the efforts expended in "beating a dead Nazi horse." It is a known fact that any German who lived in Germany during the war and who possessed any capabilities whatsoever, was a member of some affiliation of the Nazi Party. Otherwise he was placed in a concentration camp. The determining factor lies in the question of just what constitutes an active Nazi. Furthermore, loyalty to one's country can be above party ideologies even when the party is synonymous to the government and therefore the fact that an individual was a loyal German or was affiliated with the Nazi Party does not in itself imply that he is now a security threat to the United States. The scientists desired for exploitation and who are recommended for immigration have been determined by competent War Department officers as not being objectionable for entry into, nor a security threat to the United States. These scientists are proving to be an asset to the scientific research and development programs of the United States. The return of these scientists to Germany would present a far greater security threat to the United States than their retention in this country.

In a pretrial investigation of Rickhey, Air Corps Major Eugene Smith interrogated Rudolph, who gave conflicting answers, first denying seeing prisoners abused, then later describing incidents of abuse. In one example, Rudolph said, "I did not see them punished, beaten, hung, or shot." Later, when asked to describe the time 12 prisoners were hanged from the crossbeam of a crane used to move rockets through the factory, Rudolph said he did not know if they were dead when he arrived, but "I do know that one lifted his knees, after I got there."[25]

In a June 10, 1947 report of that interrogation, Smith concluded: "Mr. Rudolph impressed the undersigned as a very clever, shrewd individual. He did not wish to become involved in any investigations that might involve him in any way with illegal actions in the underground factory and as a result, was cautious of his answers." Despite Smith's suspicions, Rudolph was never investigated.[26]

One charge against Rickhey at the trial was that he signed sabotage reports against prisoners. The reports were turned over to the SD (security force) or the SS, who then tortured or hanged the prisoners. Management secretary Hannelore

Bannasch testified that it was Rudolph who "passed on" sabotage reports, and "if anybody had signed it at the Werke, it would have been Mr. Rudolph, and never Rickhey, because he never had anything to do with that factory."

The military court found Rickhey not guilty of all charges. The trial records raise the question of whether the Army tried the wrong man. "Not necessarily the wrong man," said former OSI prosecutor Eli Rosenbaum. "But Rudolph should have been in that dock either in Rickhey's place or certainly alongside him." None of the Paperclip investigations of Rudolph contain evidence about him that emerged in the Dora trial, or even mention the trial itself. On November 16, 1948, Army Ordnance recommended his immigration in the interest of national security, and his "clean" forms sailed through State and Justice. As a result, Rudolph later obtained U.S. citizenship.[27]

The absence of Dora trial evidence in Rudolph's Paperclip file is reminiscent of the controversy that arose in 1952 regarding Maj. Gen. Walter Schreiber. At the time Schreiber was employed under Project Paperclip by the Air Force School of Medicine at Randolph Field in Texas. A storm of protest erupted after columnist Drew Pearson and others publicized the extensive evidence presented at the Nuremberg War Crimes Trial (a U.S. military tribunal, not the International Military Tribunal), revealing that Schreiber had assigned doctors to experiment on concentration camp prisoners and had made funds available for such experimentation. That evidence against Schreiber was spelled out in a 1952 memorandum prepared by Alexander Hardy, former Nuremberg assistant prosecutor. He concluded that the trial records contained enough evidence against Schreiber "to have successfully convicted him in the Medical Case at Nuremberg" if the Soviets, who held him as a prisoner of war from 1945 to 1948, had agreed to U.S. requests that he be made available for the trial which occurred from late 1946 to August 1947.[28]

As in the case of Rudolph, no Paperclip investigation reports on Schreiber mentioned any of the evidence submitted to the U.S. military tribunal at Nuremberg. And even after all the publicity about Schreiber's alleged crimes, JIOA Director Benjamin Heckemeyer told a State Department representative on February 29, 1952 that "these allegations are not supported by available records."[29] However, the negative publicity caused JIOA officials to arrange a visa and job for Schreiber in Argentina, where his daughter was living. On May 22, 1952, he was flown to Buenos Aires.[30] Contacted recently by this reporter, Heckemeyer declined comment.

Lt. Col. M.C. Taylor of G-2 U.S. Forces European Theater had told the War Department on March 8, 1947 that some persons who were deemed "major offenders"—the category of the most serious offenders under the Allied denazification laws—might have been sent to the United States under Paperclip earlier, but that practice had been stopped. Taylor claimed that the specialists were now "carefully screened" to determine the subjects' Nazi status.[31]

Maj. Gen. Walter P. Schreiber testifies as a witness for the Soviet prosecution at the International Military Tribunal Trial of Major War Criminals, August 26, 1946. At the time Schreiber was a Soviet prisoner of war. *(courtesy U.S. Army Signal Corps, DAVA)*

AMONG THOSE contracted under Paperclip were several defendants in the Nuremberg War Crimes Trial Case I, *U.S. v. Karl Brandt, et al.* In what is more commonly known as the Medical Case, 23 defendants were charged with participation in gruesome medical experiments on prisoners at Dachau, Buchenwald, and other concentration camps. Among those defendants were four who worked for the U.S. military: Hermann Becker-Freysing, Siegfried Ruff, Konrad Schaefer, and Kurt Blome.

Prior to the trial, the Army Air Forces (AAF) employed Becker-Freysing, Ruff, and Schaefer at the AAF Aero Medical Center in Heidelberg. They worked at first under regular staff contracts, then on June 2, 1946 Brig. Gen. N.B. Harbold, in a memo from AAF Headquarters to the War Department, asked that Konrad Schaefer "be contracted for Project Paperclip for exploitation at Wright Field" in Ohio but be permitted to continue his work at the Aero Center until November 1. On June 14, Harbold sent an identical secret memo to request Paperclip contracts for Becker-Freysing and Ruff.[32] The Aero Center paid these men to write reports or conduct laboratory tests for Army Air Forces use that were based on wartime experiments that the Nuremberg prosecutors later charged had been conducted on concentration camp inmates.

Siegfried Ruff had headed the Department for Aviation Medicine at the German Experimental Institute for Aviation and was the Luftwaffe's expert in high-altitude research. An Aero Center *Monthly Status Report* dated March 31, 1946 states that "test runs were begun" that month using a "German built low pressure chamber." Two Army Air Forces privates were assigned to the job of "Altitude Chamber Operator." Later, the Nuremberg tribunal heard charges

of Ruff's wartime participation in high-altitude experiments that had killed up to 80 Dachau camp inmates who were locked in a low-pressure chamber that simulated altitudes up to 68,000 feet. The tribunal acquitted Ruff in what they called a "close" decision because much evidence created a "grave suspicion" that Ruff was "implicated" in the experiments.[33]

The Nuremberg prosecutors charged Becker-Freysing and Schaefer with participation in sea water experiments on Dachau camp inmates who were deprived of food and given only chemically processed sea water to drink. Becker-Freysing had headed the Department for Aviation Medicine under the chief of the Luftwaffe Medical Service. Schaefer researched ways to make sea water potable at the Luftwaffe Research Institute for Aero Medicine. Their job at the Aero Center entailed writing reports based on their war research. Schaefer stated on his JIOA *Basic Personnel Record* that his study on thirst quenching in sea emergencies was for an AAF manual.

The tribunal found Becker-Freysing guilty and sentenced him to 20 years in prison for being "criminally connected" with the experiments. Although Konrad Schaefer had attended meetings where the experiments were planned, the tribunal acquitted him and said they had found no evidence that he had participated in the Dachau experiments.

In 1949, the Air Force brought Schaefer to Randolph Field, Texas under Paperclip. Schaefer admitted on his *Basic Personnel Record* he had been tried at Nuremberg. However, not one background investigation reported that fact. One investigation by European Command, dated December 28, 1949, of Army and other police records "failed to disclose any records of previous arrests." The report of his arrest on September 16, 1946 by the Army Counter Intelligence Corps that is part of Nuremberg trial records did not appear in any Paperclip investigation report.[34]

In 1951, Schaefer was repatriated to Germany. An officer at Randolph Field told Air Force Headquarters on March 27, 1951 that "his future worth to the U.S. Armed Forces is nil," and that Air Force efforts to find him a civilian job had failed. The fact that he had been a defendant in a major war crimes trial was not a consideration.[35]

The fourth Nuremberg defendant, Kurt Blome, was contracted by the Army despite charges by Nuremberg prosecutors of his participation in euthanasia, extermination of tubercular Poles, biological warfare and other experiments. The Army Chemical Corps later wanted to use his biological warfare expertise. In a secret July 30, 1945 U.S. military interrogation report, Blome admitted that SS chief Heinrich Himmler had ordered him in 1943 to conduct plague vaccine experiments on concentration camp inmates. Blome suggested to Himmler that his new institute under construction in Poznan would be better suited for the experiments than a camp because it was isolated. Himmler then assigned an SS doctor to help with the work. The agent commented that during the interrogation Blome "had no hesitation in repeatedly referring to his intentions to use humans for his work on plague." At the time of the interrogation, Blome was under arrest in Army custody due to his major general rank in the SA.[36]

Konrad Schaefer before the U.S. military tribunal at Nuremberg, November 21, 1946. Although Schaefer was charged with human experimentation connected with sea water research, reports of his arrest and trial did not appear in any Paperclip investigations. *(courtesy U.S. Army Signal Corps, DAVA)*

At Nuremberg, the military tribunal acquitted Blome of all charges and concerning the biological warfare charge stated: "It may well be that defendant Blome was preparing to experiment upon human beings in connection with bacteriological warfare, but the record fails to disclose that fact, or that he ever actually conducted experiments."

Two months after his acquittal, on November 10, 1947, four representatives from Camp Detrick, Maryland interviewed Blome about biological warfare. Dr. H.W. Batchelor set the tone for the meeting when he told Blome, through an interpreter: "We have friends in Germany, scientific friends, and this is an opportunity for us to enjoy meeting him to discuss our various problems with him." During the lengthy interview, Blome identified biological warfare experts and their location and described different methods of conducting biological warfare. On August 21, 1951, Blome signed a contract to work for the Army Chemical Corps under "Project 63," a Paperclip-type program whose purpose was to deny the Soviet Union the German scientists' skills.[37]

As in Konrad Schaefer's case, not one background investigation reported Blome's Nuremberg trial or arrest, or his 1945 arrest for high SA rank. Blome left references to where he had been from 1945 to 1948 blank on his personnel forms. Three months after Blome signed the contract, the U.S. consul in Frankfurt ruled him inadmissible for immigration. Due to Blome's "clean" forms, there is no evidence that the consul even knew about Nuremberg but rejected him anyway due to the incriminating interrogation report.

JIOA and European Command officials feared that if Blome's contract was cancelled, other Germans might refuse Paperclip contracts. He was given a position as camp doctor at European Command Intelligence Center in Oberusal.[38]

THERE IS NO DOUBT that the U.S. military saw nothing wrong with employing war criminals. In 1949, the Air Force asked the JIOA to reinstate on hiring lists four men who had been convicted at Nuremberg. On August 30, 1949, JIOA Director Daniel Ellis asked the Army and Navy directors of intelligence for their views and attached brief resumes that focused on the chemical and poison gas expertise of I.G. Farben officials Otto Ambros, Heinrich Bütefisch, Carl Krauch, and Georg von Schnitzler.[39] These men were put back on hiring lists, but it cannot be determined from available records whether they were actually employed under Paperclip.

On September 1, 1949, Col. Frederick Sharp responded to JIOA's inquiry that Army "concurs in the Air Force proposal." Sharp said he assumed the men would not be brought to the United States "as such entry would undoubtedly be opposed by the Justice Department (FBI) on policy grounds." The names were added to the JIOA "denial" list which meant that their services should be denied to the Soviet Union and other countries. That gave U.S. military or industry a green light to hire them in Europe.[40]

Kurt Blome makes his final statement at the Nuremberg War Crimes Trial, July 19, 1947. Charged with human experimentation in the Medical Case, Blome was later contracted by the U.S. military. *(courtesy U.S. Army Signal Corps, DAVA)*

Records in the Nuremberg Trial Case VI, *U.S. v. Carl Krauch et al.*, document that the I.G. Farben plant managed by Otto Ambros was part of the Auschwitz concentration camp complex in Poland where an estimated four million prisoners died. The plant used camp prisoners as slave labor; they were starved, beaten, hanged, and forced to work amidst the stench of burning flesh that poured from the crematoria at the Birkenau extermination center at Auschwitz. Those inmates judged unfit to work were shipped to Birkenau and gassed.

THE FORMERLY classified Paperclip documents show that the War Department was intent on using Nazi specialists and was not about to let other governmental agencies or even a policy signed by President Truman get in its way. Specialists who entered the United States after 1952 were not even investigated for past Nazi connections. From the program's inception in 1945 to August 1955, 765 specialists were contracted under Paperclip. It is ironic that this program, whose original purpose was to assure that Nazi Germany could not rearm, officially ended in 1957 due to protests by West Germany that the United States had stripped that country of scientific skills.[41]

Since that time, many specialists have received the highest honors bestowed by the military on civilians and have risen to top positions at NASA and other governmental agencies and in private industry. It is true that the Paperclip specialists' skills built rockets that took Americans to the moon and made immense contributions toward the achievements in space exploration taken for granted today. But this scientific victory was accomplished at great moral cost. Dora survivor Jean Michel expressed the darker side: "English, French, Americans and Russians have shared the scientists and technicians who were our masters. And I could not watch the Apollo mission without remembering that that triumphant walk was made possible by our initiation to inconceivable horror."[42]

For decades, government agencies cared little that alleged Nazi war criminals lived free in the United States. Finally, in 1977 and 1978, a subcommittee of the House Judiciary Committee held hearings to determine whether there was a conspiracy to obstruct probes of alleged Nazi war criminals. In Subcommittee Chairman Joshua Eilberg's opinion, the Immigration and Naturalization Service "was more concerned about possible Communist propaganda and political alliance with postwar Germany than it was [about] the bringing to justice [of] criminals who participated in genocide on a scale unknown to mankind throughout history."[43]

The General Accounting Office conducted an investigation and judged in 1978 that a conspiracy was "not supported by available evidence." But later, it was discovered that some government agencies had withheld information and the GAO was asked to conduct another study that is scheduled for release this spring. The fact that top U.S. officials who ran Paperclip covered up incriminating information about alleged war criminals was not discussed in either the hearings or the first GAO report.[44]

As a result of the subcommittee's investigations, the Office of Special Investigations was established in the criminal division of the Justice Department to handle cases that had lain dormant for years, and to launch new investigations.

Nearly 40 years ago, when the search into the past lives of the Paperclip specialists uncovered criminal wartime activities, those who ran Paperclip closed their eyes in what they said was the interest of U.S. national security. To emphasize "picayune details" such as Nazi records, said JIOA Director Bosquet Wev, meant that "the best interests of the United States have been subjugated to the efforts expended in beating a dead Nazi horse."[45]

Today, it is left up to the Justice Department's OSI to pick up the pieces of those "picayune details" in the interest of salvaging justice and the United States' morality. □

1. *U.S. Army v. Kurt Andrae et al.*, Aug. 7 to Dec. 30, 1947, National Archives, microfilm M1079.

2. Clarence Lasby, *Project Paperclip* (New York: Atheneum, 1971), prefatory note, vi–ix.

3. Research for this article was conducted largely at the Modern Military Branch of the National Archives and Records Service, Modern Military Field Branch, and primarily through Freedom of Information Act requests by the author to the Archives and to various government agencies, including military intelligence and the FBI.

4. Confidential OMGUS "Final Report of FIAT," to Chief of Staff, OMGUS, Army, from Col. Ralph M. Osborn, Chief FIAT, July 1, 1947.

5. SWNCC (State-War-Navy Coordinating Committee) 257/5 March 4, 1946; SWNCC 257/23 Sept. 6, 1946; working policy SWNCC 257/24 Oct. 10, 1946.

6. SWNCC 257/24, Oct. 10, 1946.

7. Secret memo to Maj. Gen. S.J. Chamberlin, Director Intelligence WDGS from JIOA Director Bosquet N. Wev, July 2, 1947.

8. Secret memo, "State Dept. Requirements for Security in Immigration to U.S. of German Scientists," from Brig. Gen. N.B. Harbold to Commanding General attention Air Intelligence, July 9, 1946.

9. Memo, "Report on Conference with State," to Director JIOA from Cmdr. C.R. Welte, May 26, 1947.

10. Secret memo to Maj. Gen. S.J. Chamberlin, Director Intelligence WDGS from JIOA Director Bosquet N. Wev, July 2, 1947.

11. Restricted memo to Intelligence Division GSUSA from JIOA Deputy Director Walter J. Rozamus, Nov. 18, 1947.

12. Restricted memo to Cpt. Francis R. Duborg, Head Technical Intelligence Center, Office of Naval Intelligence from JIOA Deputy Director Walter J. Rozamus, Nov. 28, 1947.

13. Secret memo to the attention of Director Intelligence, Commander-in-Chief, European Command, from JIOA Director Bosquet N. Wev, Dec. 4, 1947.

14. *OMGUS Revised Security Report,* signed by Col. C.F. Fritzsche, Sept. 18, 1947.

15. *OMGUS Revised Security Report,* signed by Col. C.F. Fritzsche, Feb. 26, 1948.

16. *OMGUS Revised Security Report,* signed by Col. C.F. Fritzsche, Sept. 18, 1947.

17. OMGUS Public Safety Branch Investigation Section, Investigators Report, "The Axster Couple," March 25, 1948; OMGUS Public Safety Branch Investigation Section, Sworn Statements, especially Konrad Mommsen Dec. 18, 1946 and Feb. 5, 1948, and Gerhard Weise undated but certified by Capt. James H. Stewart.

18. Secret *OMGUS Revised Security Report,* signed by Col. W.L. Fagg, May 12, 1948.

19. For 1945 appraisal, "Qualification Sheet for German Scientific Personnel" (June 13, 1945). JIOA Security Certificate, signed by Col. R.D. Wentworth for JIOA Director Bosquet Wev, Dec. 8, 1948; *OMGUS Security Report,* signed by Col. C.F. Fritzsche, March 4, 1947; *OMGUS Revised Security Report,* signed by Col. W.L. Fagg, Sept. 27, 1948; Rudolph's Army Intelligence file XEO24572 contains a badly xeroxed copy of the March 4, 1947 report that appears to say that he "was an ardent Nazi," while the copy in his JIOA personnel file states that he "was *not* an ardent Nazi." The author sent Army Intelligence a copy of the personnel file version to compare these reports. They determined the word "not" had been cut off their copy when it was xeroxed. Letter to author from FOIA Chief Thomas F. Conley, U.S. Army Intelligence and Security Command, Jan. 24, 1985.

20. Jean Michel, *Dora* (London: Weidenfeld and Nicholson, 1979), p. 98.

21. Wernher von Braun, "Reminiscences of German Rocketry," *Journal of the British Interplanetary Society,* 15, no. 3 (1956); Walter Dornberger, *V-2* (New York: Viking Press, 1954); Dieter Huzel, *From Peenemünde to Canaveral* (Englewood Cliffs, New Jersey: Prentice Hall, 1962).

22. Albert Speer, *Inside the Third Reich* (New York: MacMillan, 1970), pp. 474–75.

23. *U.S. Army v. Andrae,* op. cit.

24. Memo to Director Intelligence WDGS from Air Intelligence Col. Millard Lewis, Dec. 19, 1946; Nehlson letter part of trial pre-investigation records.

25. Interrogation of Arthur Rudolph, by Maj. Eugene Smith and Lt. R.B. Payne, sworn June 2, 1947.

26. Report, "Investigation Regarding Activities of Dr. Georg Rickhey," from Maj. Eugene Smith to Air Provost Marshal, June 10, 1947.

27. *Certificate from Sponsoring Department,* signed by Maj. Gen. H.B. Sayler, Nov. 16, 1948.

28. Nuremberg War Crimes Trial Case I, *U.S. v. Karl Brandt, et al.*, Nov. 21, 1946–Aug. 20, 1947. On Schreiber's POW status: Secret Investigation Report, Region III 66 Army Counterintelligence Corps, Dec. 15, 1949. Memorandum, "The Case of Walter Schreiber," by Alexander Hardy, Feb. 17, 1952.

29. Memo from Benjamin Heckemeyer to Milton Harrall, Department of State, Feb. 29, 1952.

30. Secret message to Intelligence Center, European Command, from Department of Army G-2, June 2, 1952.

31. Restricted memo to Director Intelligence WDGS from Lt. Col. M.C. Taylor, Office of Assistant Chief of Staff, G-2 Headquarters U.S. Forces European Theater, March 8, 1947.

32. Memo to Director Intelligence WDGS from Brig. Gen. N.B. Harbold, Army Air Forces Headquarters, June 2, 1946; Secret memo to Director Intelligence WDGS from Brig. Gen. N.B. Harbold, AAF Headquarters, June 14, 1946.

33. Army Air Forces Aero Medical Center, "Monthly Status Report," March 31, 1946; *U.S. v. Karl Brandt et al.*

34. Investigation form, Headquarters European Command, signed by Capt. Dale L. Barrick for Col. Charles M. Adams, Jr., Dec. 28, 1949; Army CIC Arrest Report part of National Archives Nuremberg records.

35. Restricted memo to Director Intelligence, U.S. Air Force Headquarters, from Cpt. Seymour Schwartz, U.S. Air Force School of Aviation Medicine, Randolph Air Force Base, March 27, 1951.

36. Secret Alsos Report B-C/250, "Interrogation of Blome," July 30, 1945.

37. "Report of Interview of German Scientist," Dr. Kurt Blome in the Office of Chief of Chemical Corps, Headquarters European Command, Nov. 10, 1947; Defense Department Contract DA–91–501–EUC–38 signed by Blome Aug. 21, 1951, effective Dec. 3, 1951.

38. Army CIC Arrest Report in National Archives Nuremberg records; confidential message to Department of the Army for G-2 from Intelligence Center, European Command, Oct. 24, 1951; memo to Intelligence Division, from Charles M. McPherson, European Command, Nov. 27, 1951.

39. Secret memo to Head Navy Technical Intelligence Center and Chief Intelligence Division GSUSA from JIOA Director Daniel E. Ellis, Aug. 30, 1949.

40. Memo to Director JIOA from Col. Frederick Sharp, Intelligence Division GSUSA, Sept. 1, 1949.

41. Secret Activities Report of the JIOA for Aug. 1955, signed by JIOA Director Lloyd L. Hanes, Sept. 9, 1955; "Top Secret" Joint Chiefs of Staff policy 1363/75 Feb. 15, 1957. News reports in recent months stating that over 1,500 specialists came into the United States are in error because that figure, from 1952, includes dependents.

42. Jean Michel, op. cit., pp. 300–301.

43. Hearings before the Subcommittee on Immigration, Citizenship, and International Law of the Committee on the Judiciary, House of Representatives, 95th Cong., Part I, Aug. 3, 1977, Part II, July 19–21, 1978.

44. Report by the Comptroller General of the United States: "Widespread Conspiracy to Obstruct Probes of Alleged Nazi War Criminals Not Supported by Available Evidence—Controversy May Continue," U.S. General Accounting Office, May 15, 1978.

45. Secret memo to Maj. Gen. S.J. Chamberlin, Director Intelligence WDGS, from JIOA Director Bosquet N. Wev, July 2, 1947.

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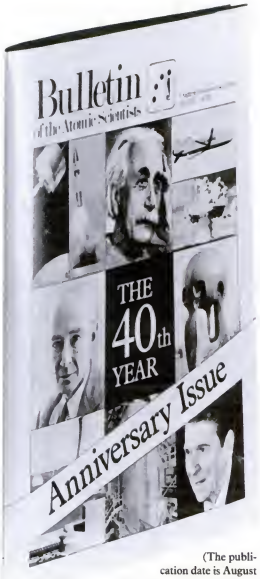

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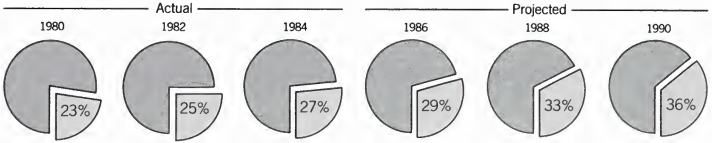


Military spending boosts the deficit

Propelled by strategic weapons, the growing military portion of the budget is sending the federal deficit to unprecedented levels. Even greater increases are planned for future years.

by Gordon Adams and Laura Weiss

PRESIDENT REAGAN ushered in the first year of his second term by renewing his earlier calls for a balanced budget amendment. But, as the president has made clear on several occasions, he is not asking the Pentagon to ease its spending spree as part of the Administration's overall effort to lower the deficit.

For fiscal 1986 alone, budget authority for the Defense Department is slated to go up nearly 6 percent, after inflation, while outlays are projected to rise over 8 percent. If Reagan's forecasts for future budgets hold true, increases in Defense Department budget authority could soon edge close to 9 percent in real terms.

Congress, which wants to reduce the swollen federal deficit, has expressed dismay at the size of the defense budget. The Administration, anticipating a congressional drive to slow defense expenditures, moved quickly to claim it had already "cut" its military budget. But fiscal 1986 Defense Department spending is going up, not down. The Administration is asking Congress to approve for the Pentagon $313.7 billion in fiscal 1986 budget authority, a $29 billion increase over 1985. Fiscal 1986 outlays, or actual spending, are pegged at $277.5 billion, an increase of $31.2 billion over 1985.

These hikes should raise serious questions about Defense Secretary Caspar Weinberger's assurances that he and his department will be in the front line of the president's war against the deficit. In reality, that task falls to the domestic portion of the budget. Spending from fiscal 1986 to 1988 for education, health, employment, and other human-resources programs, except Social Security, has undergone a real cut of $65.6 billion, almost exactly the same amount as was trimmed from these programs in 1981 and 1982. Low-income programs alone would be reduced by $34 billion over the next three years and would be asked to shoulder nearly one-fifth of the total proposed budget cutbacks.

These statistics confirm what history already tells us: defense spending, not domestic programs, has been a chief culprit in driving up the deficit. For example, in fiscal 1980, the deficit was $74 billion, and Defense Department outlays were $131 billion. By fiscal 1986, the deficit will have risen, according to Administration estimates, to $180 billion. Meanwhile, defense spending will skyrocket to $277.5 billion.

STEPPED-UP weapons expenditures continue to be the key force driving the Administration's request for defense spending hikes. Not only do new weapons take a sizeable bite out of the defense dollar, but, once begun, they are nearly impossible to cancel: a political constituency forms to fight off attempts to slow down or eliminate weapons systems from the budget.

The huge Pentagon budget is increasingly devoted to research and procurement of major new weapons systems:

- Spending on investment (research, development, and procurement of strategic and conventional weapons, and military construction) has tripled in current dollars since 1980, rising to $153 billion in fiscal 1986. As a percentage of the total Pentagon budget, investment has risen from 36.3 percent of fiscal 1980 budget authority to 48.8 percent of total fiscal 1986 authority. By 1990, investment alone will consume $247 billion, over half of total Defense Department spending for that year, according to Pentagon figures.
- Strategic weapons are the main propellant of this weapons-driven budget. Spending on strategic weapons alone soared from $9.4 billion to $38.1 billion, an increase of 305 percent, including inflation, between fiscal 1980 and 1986, according to the Office of Management and Budget (OMB).
- The "Star Wars" plan to intercept enemy missiles in

Gordon Adams, the director of the Defense Budget Project at the Center on Budget and Policy Priorities in Washington, D.C., is the author of The Iron Triangle: The Politics of Defense Contracting *(1981). Laura Weiss is a writer and editor at the Center on Budget and Policy Priorities.*

space is likely to drive up weapons spending in the future. Star Wars, or the Strategic Defense Initiative (SDI), will command $3.7 billion in budget authority for fiscal 1986, or nearly triple the amount it received in 1985. The Administration says it will ask for $4.9 billion for the system in fiscal 1987.

- Meanwhile, money for operating and maintaining equipment and military bases around the world has been cut back sharply as a percentage of the defense budget as a whole. Although in current dollars, budget authority for operations and maintenance has almost doubled since 1980, (reaching $82 billion in fiscal 1986), it has not kept pace with investment, which has tripled. As a percentage of Defense Department budget authority, operations and maintenance have fallen from 33 percent in fiscal 1980 to 26.3 percent in fiscal 1986. Similarly, military personnel costs, which at $41 billion represented 29 percent of 1980's Pentagon budget authority, will fall to 23.4 percent in 1986 ($73 billion) and a tiny 16.6 percent ($80 billion) by fiscal 1990.

Weapons costs show that defense spending is spiraling out of control. Until it is reined in, curbing the deficit will be virtually impossible. The uncontrollable share of Pentagon outlays (money now firmly tied to already existing weapons contracts), continues an inexorable upward climb. At the end of the Carter Administration, uncontrolled expenditures were 27.2 percent of fiscal 1980 defense spending. In fiscal 1986, 38.2 percent of outlays will be uncontrollable. If current trends continue, by the time a new administration takes office in 1989, roughly 40 percent of the defense budget will be beyond its control.

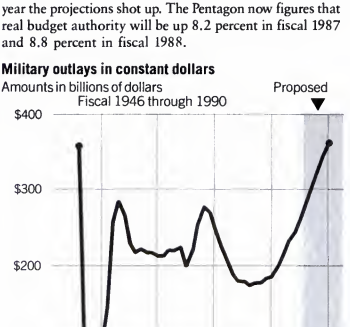
The uncontrollables are fed by the Defense Department's growing backlog of unexpended and unobligated funds, that is, appropriations from previous years that have not yet been spent. This backlog—committed largely to new weapons—has risen from $92 billion at the end of fiscal 1980 to an estimated $279.6 billion at the end of fiscal 1986.

"Stretchouts" are a related problem. Although the Pentagon has said it will purchase weapons at economically efficient rates, it continues to "stretch out" the rate at which it is buying new weapons by spreading purchases out over a number of years. This allows the Defense Department to spend less each year. But total costs go up because of inefficiencies that occur when production is stretched out.

THE DEFENSE BUILDUP and its effect on the deficit have other important ramifications both now and in the future:

- Secretary Weinberger is claiming that the nation's security will be imperiled if Congress cuts the defense budget in order to lower the deficit. But some members of Congress are considering a defense freeze as part of a package of spending cuts aimed at slicing the deficit in half, to $100 billion by 1988. Defense Department budget authority would be shaved, but only by the rate of inflation.
- The Defense Department claims that it has cut its budget because it computes budgetary changes in a way that the Administration does not for other federal agencies. The Defense Department's unique methodology allows budget officials to begin their tabulations at an unrealistically high level, or baseline, and call anything below it a "cut." Pentagon officials point to this number as evidence that they are working to lower the deficit.
- In fact, defense outlays are at a 39-year peak and likely to go even higher. Not since 1946, including the years of the Korean and Vietnam Wars, have real outlays been so high. Fiscal 1986 national defense outlays—which include funding for the Pentagon, plus Department of Energy nuclear warheads and other federal agencies' defense work—will rise in constant dollars to $285.7 billion. Between fiscal 1980 and 1990, outlays for national defense will soar by 90.5 percent, after inflation.
- The fiscal 1986 budget also shows that Defense officials clearly hope to recoup this year's "losses" in future years. For example, in February 1984 the Defense Department forecast a 3.5 percent real increase in budget authority for fiscal 1987, and 3.8 percent for fiscal 1988. But this year the projections shot up. The Pentagon now figures that real budget authority will be up 8.2 percent in fiscal 1987 and 8.8 percent in fiscal 1988.

Military outlays in constant dollars



Michael Yanoff, United States

It is clear that control over future military spending depends on close scrutiny of the defense budget this year. Congress will have its hands full trying to pare back defense spending in order to come up with some of the savings it needs to lower the deficit. In fact, if lawmakers are really serious about curbing the growth of the deficit, defense is one of the few areas that will provide the savings it needs. □

The Oak Ridge Y-12 plant, operated by Martin Marietta Energy Systems, Inc. for the Department of Energy. The reopening of a uranium conversion facility here signals the end of a 20-year moratorium on fissionable materials production. *(courtesy Martin Marietta)*

U.S. to resume uranium production for weapons

A superpower race to amass more nuclear explosives defeats the goal of long-term arms control. The Administration may also be using production of warhead materials as a "backdoor" to authorizing weapons not approved by Congress.

by Robert Alvarez and Debra Sherman

AS NUCLEAR ARMS talks resume in Geneva, the United States is accelerating its drive to amass more nuclear explosives. This year, the U.S. Department of Energy is moving to end a more than 20-year voluntary moratorium on the production of highly enriched uranium for nuclear warheads. This measure, according to defense experts, heralds the introduction of significantly more destructive nuclear weapons scheduled for deployment in the 1990s.

The process was started in the closing days of Congress last year when $5 million was quietly appropriated to begin refurbishing an obscure uranium conversion facility at the Energy Department's Oak Ridge, Tennessee Y-12 weapons plant that had been closed in 1964. The Department is requesting $20 million to complete the project by 1989. The conversion facility carries out the first essential step in reducing highly enriched uranium gas to a metal for use in nuclear warheads.

In the absence of limits on production of fissionable material, agreements to limit deployment of nuclear weapons systems are at best temporary. For this reason, the Reagan Administration has been careful not to integrate nuclear explosives production into arms control objectives. "We almost certainly need . . . new warheads with new characteristics even if we achieve our goal in arms control at least for the next few decades," stated Richard L. Wagner, assistant defense secretary for nuclear energy, in justifying stepped-up fissionable material production before a House Armed Services subcommittee in March 1983.

This has not always been U.S. policy. Between 1956 and 1969, the United States repeatedly proposed to the Soviet Union a cut-off of fissionable materials production. But the Soviets, who had fewer nuclear warheads than the United States, rebuffed the idea.

However, in June 1982, Soviet Foreign Minister Andrei Gromyko made a similar offer before the U.N. Special Session on Disarmament. Gromyko suggested that "the cessation of production of fissionable materials for the manufacture of nuclear weapons" could be one of the "initial stages" of a "nuclear disarmament program."

Unfortunately, the Reagan Administration has ignored the Soviet offer and continues to amass even larger amounts of fissionable materials, in particular highly enriched uranium or "oralloy" (Oak Ridge alloy).

Oralloy was first used in "Little Boy," the bomb that was exploded over Hiroshima in August 1945. It is over 90 percent uranium-235—an element which occurs in nature in greatly diluted states. Oralloy was produced at government-owned uranium enrichment plants until 1964, when President Lyndon Johnson initiated a voluntary moratorium on production mainly because the United States had more than it needed. Since that time, the United States has relied on the recycling of old warheads and the existing stockpile of oralloy at the Oak Ridge Y-12 operation.

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The Energy Department continues to enrich uranium to over 20 percent uranium-235 but uses that only in naval reactors, nuclear material production, and research reactors.

Currently, oralloy is used in substantial amounts in at least 12 different warhead types. Most of it is contained in thousands of tactical weapons—the majority of which are nuclear artillery shells deployed in Europe and Korea since the 1950s. Although these fission weapons are to be retired in the near future, Energy officials claim that the United States will have a shortfall of oralloy by 1988. For example, at hearings before a House Armed Services subcommittee in February of last year, an Energy Department deputy assistant secretary, Charles Gilbert, indicated that though there is enough oralloy "lying around" to last until 1988, the government will have to resume production after that.

When asked, at later hearings of the House Energy and Water Appropriations Subcommittee, why the supply from recycled warheads would not suffice, Gilbert's answer was deleted. But he did say that "a definite answer to this question would require a significant joint study effort with the Department of Defense to adjust weapons systems priorities." The findings of that study are classified.

Despite the secrecy surrounding the need for more oralloy, enough information exists on the public record to suggest that it will most likely be used to increase the explosive yield of certain thermonuclear weapons. Milton Hoenig, coauthor of the *Nuclear Weapons Data Book*, believes that oralloy will be used for the MX and Trident II warheads. This kind of warhead explodes in three stages and is known as a "fission-fusion-fission" device. The first stage involves the fissioning of a plutonium-239 "trigger" which ignites the second or fusion stage. During the fusion stage, enormous amounts of energy and neutrons are released which then strike the "blanket" surrounding the warhead, currently made of depleted uranium or uranium-238. The blanket is then fissioned, boosting the explosive yield by as much as 30 to 50 percent.

According to Hoenig, "The yield can be increased another 50 percent by [replacing] the depleted uranium blanket with oralloy." Energy official Charles Gilbert hinted that this may be the case when he told the House Armed Services Committee that a new warhead for the Trident II missile would necessitate increased oralloy production.

Another potential use for oralloy in the Trident II warhead is as a substitute for the plutonium-239 trigger. Because of its relative chemical stability, oralloy poses less chance for accidents than plutonium, which ignites in open air.

The likely candidate for an oralloy blanket is the W-87 warhead to go on the MX. Production of the W-87 began last year, and it will enter the stockpile by 1986, with a minimum of 1,050 planned for deployment. The warhead already contains oralloy (presumably in the first stage to enhance neutron output) and has a special feature that would make it possible to increase its yield from 300 to 475 kilotons by adding more oralloy at a later date.

The W-87 may also be used for the Trident II, although other options are being considered. The Trident II D-5 missile will carry more, larger, and heavier high-yield warheads than the Trident I.

The Trident I would suffice for retaliation against a Soviet first strike, but has been characterized by the Defense Department as lacking first-strike capability because of its alleged inaccuracy. Although Trident I accuracy is far better than previously believed [see "Sleight of Hand with Trident II," *Bulletin*, December 1984], the Trident II would be useful for either a retaliatory or a preemptive strike. Its accuracy and capacity to carry more and larger warheads than Trident I make it capable of destroying Soviet ICBMs and therefore fit for the Reagan counterforce doctrine. Conversely, the Soviet Union could reasonably be concerned that Trident II deployment suggests the United States intends to launch a first strike. This gives the Soviets reason to put their missiles on hair-trigger alert.

> "We are beginning to know more about how [Soviet] leadership views the arms competition, and we can see considerably more clearly than we could a few years ago that a lot more is involved in deterring them than just the arithmetic of exchange calculations. . . .
>
> "What it comes down to in the end, I believe, is to keep their image of themselves inferior to their image of us, so that in a crisis they will have a gut feeling that they won't measure up against us.
>
> "I think that is what this is really all about....
>
> "The U.S.S.R. is pushing advanced technology hard, both developing it on their own and stealing it from us. . . . I believe that we must not allow them to come to feel that the technological part of the balance has shifted in their favor.
>
> "I think that by the nineties we may well need some really new technology to keep the image ratio in our favor, and I think that the kind of advanced technologies afforded by the very new concepts being developed by DoE might well fit that part of the equation."
>
> —*Richard Wagner, assistant to the secretary of defense for atomic energy, before the House Armed Services Committee, March 1, 1983.*

A congressional source suggests that oralloy may also find its way into warheads for the next generation of supersonic cruise missiles, now in the research and development stage. Cruise missiles of the current generation are not considered

to be counterforce weapons because they do not fly fast enough. Using oralloy to increase their yield could conceivably offset their small size and enhance their ability to destroy hardened silos.

The introduction of a supersonic cruise missile that could destroy silos could undermine agreements to limit counterforce weapons. Concerned that increased fissionable material production will ultimately be used in a destabilizing manner, arms control experts have criticized the Energy Department's warhead material program as a "backdoor" way to authorize nuclear weapons not approved by Congress. Gerard Smith, chief of the SALT I delegation, joined other critics in signing a recent letter to Congress which stated that "the DOE is attempting to build a costly billion dollar 'surge' capacity above and beyond the arsenal requirements"

> "The potential for unforeseeable increases in future demands [for nuclear materials], combined with with . . . present limitations, dictates a need for at least some surge capability which does not now exist and might be needed to respond, for instance, to a Soviet breakout or abrogation of existing treaties. . . .
>
> "Soviet knowledge, and they certainly know of the U.S. inability to surge weapons production, could serve as an incentive for the Soviets to actually develop a breakout strategy for the future, a strategy on their part which I think would be a disaster."
>
> *—Richard Wagner, assistant to the secretary of defense for atomic energy, before the House Armed Services Committee, March 1, 1983.*

and is "using the time-honored shortage argument" to meet this objective.

Energy officials deny that they are building a surge capacity in the technical sense of an installed excess industrial production capacity. But they do not rule out the possibility of building a surplus stockpile of fissionable materials for "contingencies."

Reagan Administration officials have repeatedly expressed the need for surge capacity to Congress. They point out that the Soviets can rely on their civilian nuclear power program if needed to provide extra fissionable materials. The United States, on the other hand, is forbidden by law from using nuclear material generated by U.S. commercial reactors for nuclear weapons production. This "asymmetry" in the U.S.-Soviet "image ratio" as described to Congress by Richard Wagner appears to be a major reason for the drive to build up nuclear explosives stocks.

But even an informed supporter of the Reagan nuclear weapons agenda has raised doubts about the U.S. nuclear explosives policy. In the summer 1982 issue of *Strategic Review,* Arnold Kramish, then affiliated with the conservative Heritage Foundation, argued that exactly because the Soviets have the capacity to produce six times more plutonium than the United States, limits on fissionable material production should be part of arms negotiations. If the U.S. bargaining positions "do not consider the mismatch between production and agreed limits they will have less relevance to the real world than had SALT," Kramish concluded.

Regardless of differences between the U.S. and Soviet plutonium production capabilities, the amount of oralloy currently in the U.S. nuclear program is immense. Estimates of the oralloy stockpile range between 500 and 700 metric tons,* of which several tons are retrieved each year from recycled warheads.

The Energy Department has stockpiled over 40,000 metric tons of natural uranium yet to be enriched. John Longenecker, deputy assistant secretary for uranium enrichment, states: "If we continue to produce highly enriched uranium for what we are using it now . . . this supply will last for at least 20 years, probably 30. With this supply, there is no need to buy any more uranium."

But with the alleged shortfall of oralloy expected in the next few years, Longenecker's views differ from those of Charles Gilbert or Ronald Cochran, Gilbert's successor at the Department. "There will be a need to replenish the stockpile," says Cochran. In testimony before Congress last year, Gilbert was more specific, stating that the Department will have to purchase "more raw uranium and begin separating enriched uranium in diffusion plants" by 1988.

"Just as demand for uranium in the commercial sector is reaching rock bottom, the nuclear weapons program is clamoring for more oralloy," says Hoenig. "Once they have more of it, they will find a way to use it."

Finding a way to use more oralloy is contrary to the stated nuclear arms control policy objectives of the Reagan Administration as contained in the fiscal 1985 Arms Control Impact Statement submitted to Congress last year. These objectives include:

- significant reductions in the destructive potential of nuclear arsenals;
- seeking agreements which will lead to equal levels of forces on both sides;
- seeking agreements which will enhance U.S. and Allied security and reduce the risk of war; and
- insistence on verification measures to ensure compliance with provisions of arms control agreements.

Achieving the first objective, which could be a start toward reaching the subsequent objectives, will be made impossible by a race between the superpowers to amass more nuclear explosives. U.S. resumption of oralloy production rules out the possibility of a fissionable material cut-off and, more seriously, raises doubts about the prospects for long-term nuclear arms reductions. □

*Barbara Levi and Frank von Hippel, "A Cutoff in the Production of Fissile Material for Nuclear Weapons," *Journal of the Federation of American Scientists,* 38, no. 2 (Feb. 1985).

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Energy Department's weapons conglomerate

The weapons establishment's nuclear promotion—plus a campaign against a nuclear freeze similar to the one that has stymied the comprehensive test ban—combines hard-sell lobbying with the promise of new technologies.

by David C. Morrison

"WE ARE BEFORE you with what represents something unique in the U.S. Government—that is, a totally Government-owned, integrated industry," said William Hoover, the Department of Energy's deputy assistant secretary for military applications, introducing his spring 1982 budget appeal to Congress. "A corporation, if you will, for which we are responsible. I would like the committee to consider themselves as the board of directors of that corporation. My remarks are in essence a prospectus of our corporation, and the record of this hearing will serve as our stockholder's report."[1] This government-owned industry is unique indeed. Among what Hoover describes as "generic products" of his "corporation" is the B-61 tactical and strategic nuclear bomb: 1,800 parts, 570 suppliers and nine primary contractors.

The nuclear weapons complex managed by the Department of Energy is a far-flung archipelago, occupying a land area "equal to the size of Delaware plus 1½ times the size of Rhode Island," with 52,500 employees and $25.4 billion in assets.[2] If nuclear weapons were traded on the stock exchange, Energy would rank ninth in the Fortune 500, after Standard Oil of Indiana. Energy enjoys a monopoly more absolute than that once held by American Telephone and Telegraph. Its only major competitor is the Ministry of Medium Machine Building, which turns out nuclear weapons for the Soviet military. But because its products are not as popular as they might be, the Department of Energy, like its predecessors the Atomic Energy Commission and the Energy Research and Development Administration, uses a hard sell to peddle its more-is-better philosophy of nuclear national security to presidents, the Congress, and the public.

Federal agencies have long used inflated rhetoric and colorful graphics to sell their budgets to a harried Congress, and none plays the briefing game quite as well as the Department of Energy. In 1983, for instance, Hoover wielded a "Fulda Gap Brand Swiss Cheese" cartoon to drill home his point that Congress had to authorize the W-82 neutron warhead for the 155-millimeter artillery shell lest the Soviets roll right through "a swiss cheese kind of defense" in the Fulda Gap, a main invasion route into West Germany.[3]

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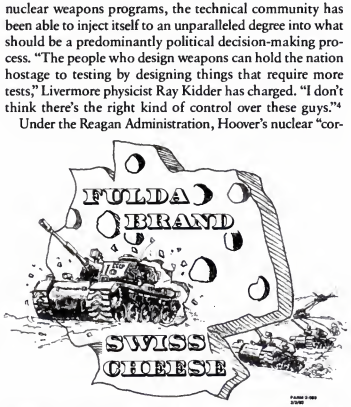
Much more than sales gimmicks is involved, however. The Department and its nuclear brain trust at the three national nuclear weapons labs—Lawrence Livermore, Los Alamos, and Sandia—skillfully parlay promises of tantalizing new nuclear weapons designs and dire predictions of emerging Soviet nuclear design superiority into a political consensus that keeps their production lines running at full capacity. Over the last two decades this carrot-and-stick campaign has succeeded in dissuading presidents and Congresses from pursuing the comprehensive test ban, a goal to which the United States formally committed itself in signing the 1963 Limited Test Ban Treaty. With the rise of the nuclear freeze movement, the Energy weapons establishment has strongly renewed its campaign of nuclear promotion. Seldom do Energy and weapons laboratory officials appear before Congress without decrying the evils of a freeze.

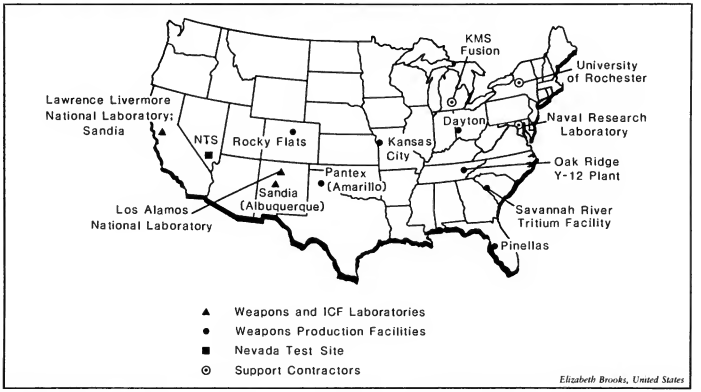
Thanks to the cloak of national-security secrecy over nuclear weapons programs, the technical community has been able to inject itself to an unparalleled degree into what should be a predominantly political decision-making process. "The people who design weapons can hold the nation hostage to testing by designing things that require more tests," Livermore physicist Ray Kidder has charged. "I don't think there's the right kind of control over these guys."[4]

Under the Reagan Administration, Hoover's nuclear "cor-



William W. Hoover showed this cartoon to the House Armed Services Committee during its March 1983 hearings on Department of Energy funding.

The "nuclear archipelago"



This view of the Department of Energy's weapons complex is adapted from a map shown by William W. Hoover during the March 1983 House Armed Services Committee hearings.

poration" is prospering more than it has since the late 1950s when the U.S. stockpile quadrupled from 7,000 to 29,000 nuclear weapons in five years. While Energy also oversees civilian energy programs, nuclear weapons take a growing share of its budget. Out of a fiscal 1985 Energy Department budget of $11.8 billion, $7.4 billion, or 63 percent, goes to military nuclear programs, including naval nuclear reactors; in 1980 that share was only $3.0 billion, or 25 percent.[5]

"Ultimately, our funding level is driven by the number of weapons that have been approved by the President," Hoover informed a House subcommittee two years ago, displaying a graphic deleted from the public record. "We call this our mountain chart for obvious reasons and we are on it and climbing."[6] Those weapons—Trident II and MX warheads, nuclear gravity bombs, and so on—represent little more than business as usual, albeit on a vastly expanded scale. Over the next decade the Administration plans to build as many as 21,000 new nuclear warheads, bombs, and artillery shells. (See "Resource Paper on the U.S. Nuclear Arsenal," *Bulletin*, August-September 1984.) Energy faces a herculean task in gearing up to meet this production surge. "Our nuclear weapons industry," Hoover complained in 1982, "is suffering from some of the same problems that are plaguing the American automobile and steel industries."[7] So, following what it terms its "long-term investment strategy," the Department is in the sixth year of a nine-year, $3.6 billion laboratory modernization effort, revamping such facilities as a Los Alamos detonator laboratory housed in a World War II quonset hut.

The Department is also looking at new challenges on the horizon of weapons physics. A portion of its $1.7 billion fiscal 1985 research and development budget is being spent in pursuit of revolutionary new concepts in nuclear explosives design known as "third-generation nuclear weapons." The first generation was fission or atomic weapons, such as those dropped on Hiroshima and Nagasaki. The second generation is fusion or hydrogen weapons, which make up the bulk of the current arsenal. The third generation, says Assistant to the Secretary of Defense for nuclear energy Richard Wagner, are "weapons in which a part of the total energy produced by the explosion is converted in some way to a form more precisely tailored to the need than just blast and heat, the most well-known effects of nuclear weapons in the past."[8]

Enhanced radiation weapons—"neutron bombs"—are the relatively simple precursors of this third generation. The more sophisticated "tailored output" weapons now being touted by the national laboratories include: weapons maximizing the electro-magnetic pulse created by nuclear explosions for knocking out enemy electronics and communications, H-bomb-boosted X-ray lasers for space-based missile defense, and directed plasma weapons narrowly focusing the effects of an ordinarily uniformly spherical nuclear explosion.

The most publicized third-generation program is the H-bomb-boosted X-ray laser, code-named "Excalibur." Part of Reagan's Strategic Defense Initiative, Excalibur has been most actively boosted by Edward Teller, who has been cam-

paigning for defensive nuclear weapons for more than two decades.

Excalibur—named, appropriately enough, after a mythical sword—is being crafted by Teller's protégés at Lawrence Livermore, which he helped found and once headed. As many as four scaled-down tests have been conducted since late 1980 in vacuum chambers beneath the Nevada Test Site. A detailed account of the first X-ray laser test shot found its way into the February 3, 1981 issue of *Aviation Week*

> "Some proposals are being put forth in these [arms control] negotiations that may draw into question the need for proceeding with certain development programs. But ambiguity of that kind is part of the process of negotiation. We as a nation need to have the resolve to continue development programs while we continue to negotiate because the persuasiveness of our arguments is in large measure dependent upon the strength of our forces as perceived, and the credibility of our weapon development programs. . . .
>
> "Remember, we have not yet found a suitable alternative to the nuclear weapon for deterrence. If you are going to have nuclear weapons as the underpinning of your deterrence, does it make sense to stop production? . . .
>
> "Should we stop research and development? Well, I think not, unless you are in favor of a unilateral technological lobotomy, because we cannot excise from the knowledge of the world today the knowledge of nuclear physics."
>
> *—William W. Hoover, deputy assistant secretary for military applications, Department of Energy, before the House Armed Services Committee, March 1, 1983.*

and Space Technology, which often serves as an outlet for the Air Force and defense industry's selective leakage of optimistic data on pet projects. That story led dissident Livermore physicist Hugh DeWitt to charge in an angry letter to the president of the University of California at Berkeley, the laboratory's parent institution, that the leak was a deliberate attempt to build support for third-generation programs.

Some insiders suggest that Livermore may be inflating the promise of a third generation to pump up its budget. "The lab cannot be expected to be objective in this area," contends Livermore critic Ray Kidder. "It is powerfully motivated to advocate a novel third generation of nuclear weapons, recognizing that the first and second generations have reached a point of diminishing returns."[9] Significantly, Argonne National Laboratory, an energy research facility, has seen its budget plummet 29 percent to $249 million in fiscal 1984, from $317 million in 1979, while Livermore's funding jumped 63 percent, from $456 million to $744 million over the same period. "We've been in a recession here," Argonne physicist Ed Walbridge complained last year. "I call my friends out at Livermore and they're booming. We're an energy lab, a non-weapons lab, and we're suffering."[10]

Nuclear programs, of course, are also driven by motives rather more complex than simple pork-barrelling. Weapons physicists have long striven to comprehend their vocation as service to the cause of deterrence. Always, it seems, there is a novel nuclear device just around the corner that will make a third world war truly unthinkable. The momentum seems inexorable: we need more and better nuclear weapons to ensure that the thousands we have already will never be used.

"If A-bombs in their *present* form will make another war something which mankind cannot bear," Los Alamos physicist Theodore Taylor wrote in 1949, "and if most people don't realize this, then, I say, there is only one thing to do: develop a bomb which will leave no doubt in *anyone's* mind."[11] Taylor went on to design the "Davy Crockett," at .25 kilotons, one of the smallest tactical nuclear weapons to enter the arsenal, as well as the Super Oralloy Bomb, at 500 kilotons the largest fission weapon ever detonated.

"Nowadays I would be quite willing to go and do full-time weapons work because I see vast possibilities," a 28-year-old physicist told the *New York Times* last year. "A tremendous amount of creativity is needed, and there are very few scientists willing to do it. Nuclear weapons can devastate the world. I recognize that. But we are making antiweapons. Why not find technical solutions to a technical problem?"[12]

Experts, both within and outside the official nuclear weapons community, are typically divided over whether the third generation technical solutions will ever succeed. Whether or not the concept proves exploitable, the mere existence of third-generation research programs fulfills two important short-term objectives for the Energy Department:

- The psychological goal has been articulated by Wagner. "The final reason for accelerating advanced technology in the DoE program," he told a congressional subcommittee in the spring of 1983, "relates to what I call . . . keeping the Soviets in a deterred frame of mind. . . . What it comes down to in the end is for us to keep their image of themselves inferior to their image of us, so that if a crisis comes along, they will have a gut feeling that they won't be able to measure up against us. It is a lot more than just numbers of weapons, the sizes and yields."[13]
- Of more concrete utility has been the political role played by the promise of a revolutionary new generation of weapons in stalling a comprehensive test ban (CTB), an arms control measure proponents feel would put a qualitative brake on the arms race. A CTB would also put major sectors of Energy's nuclear weapons "corporation" out of business.

The test ban has been the prize in a long-running war of attrition waged by Energy and its predecessors, the most recent major battle of which was fought during the Carter years. Within days of coming into office, President Carter declared achievement of a full CTB to be an immediate goal of his Administration. By 1978 major strides were being made in Geneva on a treaty that had not seen this kind of progress in 15 years. But there was considerably more accord in Geneva than in Washington, where the nuclear-weapons establishment was fighting a rear-guard skirmish to limit severely any test ban treaty.

The telling blow fell late in the summer of 1978 when Energy Secretary and former Atomic Energy Commission Chairman James Schlesinger approached Carter with Los Alamos director Harold Agnew and Livermore director Roger Batzel. Basing their arguments in part on the need to develop the coming generation of nuclear weapons, Batzel and Agnew urged Carter to take a harder line and to narrow the scope of the proposed treaty. This Carter did, dashing hopes for early agreement. The laboratory chiefs' visit came at a crucial moment, recalls former Arms Control and Disarmament Agency chief Paul Warnke, "because at that point Carter was already a bit reluctant to proceed with the CTB because SALT II was overloading the political circuits."[14]

"No question about it," Agnew later said in the Summer/Fall 1981 issue of *Los Alamos Science*. "We influenced Carter with facts so that he did not introduce the [treaty] which, we subsequently learned, he had planned to do. There's no question in my mind that Roger and I turned Carter around, because we incurred so many enemies from the other side!" In September 1983, the Reagan Administration notified Congress that it had no intention of picking up the talks where they had left off in 1980 because it needed accelerated testing to solve "important problems" in weapons physics.

The weapons establishment's reaction to the Limited Test Ban in the early 1960s had been a word-perfect rehearsal for the anti-CTB campaign of the late 1970s. Wagner today sounds the alarm of a Soviet nuclear design breakthrough of Sputnik proportions. In 1962 Teller was warning darkly that "the probability that a nuclear gap exists right now, in addition to a missile gap, is frightening and real."[15] Wagner tantalizes Congress with the promise that third-generation weapons, with their "ability to be very selective in the damage done or not done, could be the most significant change in nuclear weapons technology since the early days of the nuclear era."[16] Twenty-five years ago, Teller and his colleagues argued that a test ban would preclude development of pure-fusion battlefield nuclear weapons. In a preview of Schlesinger's 1978 White House lobbying, Atomic Energy Commission Chairman Lewis Strauss assembled weapons physicists Teller, Ernest Lawrence, and Mark Mills before Eisenhower in 1957 to testify that a limited test ban would foreclose development of those "clean" weapons.

That early third-generation weapon was what we today call the neutron bomb. But enhanced radiation weapons are not really very clean since no one has yet found a way to ignite the hydrogen-fusion reaction that creates deadly neutrons without using a dirty fission weapon as a trigger. Even the "father of the neutron bomb," Sam Cohen, admits it is "not the neutronic cat's pajamas." A real neutron bomb, he maintains, should be "like somebody with bad breath; if he's right next to you, you'll really know it; if he's across the room you won't care."[17] Yet the promise of this mythical clean bomb was a chief weapon in the laboratories' rhetorical arsenal against the Limited Test Ban. "I knew we were pushing hard," recalls a Lawrence Livermore physicist who worked on the neutron bomb. "That was one of our things to sell for many years."[18]

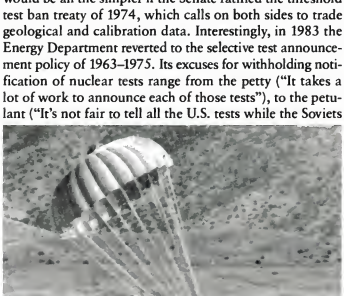
> "We do a very careful evaluation of the options available to produce the various components, whether we should produce them within our own resources or procure them from outside sources in industry.
>
> "Let me give you an example of what I am saying.
>
> "The Bendix plant primarily produces electronics and plastic components and does some light machining. They produce some 101 end item components, . . . [and] those components are made up of some 1,500 bits and pieces that are supplied by some 380 contractors.
>
> "In turn, Bendix ships these end item components to Mason and Hangar at Pantex, where there is one end item, the bomb.
>
> "The point is, we do support a broad cross section of American industry with the budget that you are considering today. In addition to suppliers of bits and pieces and raw materials, we obviously support other aspects of American industry, such as the heavy machine tool industry in which we will be spending some $174 million out of the budget we are requesting today.
>
> "Your decisions with regard to our funding level therefore have economic consequences across a broad range of the American economy."
>
> —*William W. Hoover, before the House Armed Services Committee, March 1, 1983.*

Although the nuclear weapons establishment lost the Limited Test Ban battle, it seems to have won the war. The quid pro quo it extracted before being driven underground rendered the test ban more an atomic "clean air act" than the restrictive arms control measure once envisioned. "One of the political prices paid for getting wide acceptance of

the Limited Nuclear Test Ban Treaty in Congress consisted of a promise by the Atomic Energy Commission to conduct an underground test program vigorous enough to 'satisfy all our military requirements,'" Lawrence Livermore's first director, Herbert York, noted in 1970. "It has therefore been judged necessary to conduct such testing at an even faster rate than in the fifties, when aboveground testing was possible. During the sixties the operations at the Nevada test site were conducted on a year-round basis rather than in batches as they were in the forties and fifties."[19]

In the 1960s much was also made of the obstacles to verification of a test ban, obstacles exaggerated by conjuring up elaborate means by which the Soviets might continue to test surreptitiously: exploding weapons in interplanetary space or on the far side of the moon, scheduling tests to coincide with earthquakes, and muffling tell-tale seismic tremors by exploding the devices in vast underground caverns. "I had the doubtful honor of presenting the theory of the big hole to the Russians in November 1959," Hans Bethe, a physicist on Eisenhower's Science Advisory Committee, wrote in the early 1960s. "I felt deeply embarrassed in so doing. . . . I think that they would have been quite justified if they had considered this an insult and walked out of the negotiations in disgust."[20]

The less farfetched verification anxieties of the last decade revolve around our ability to detect surreptitious Soviet tests down to virtually militarily useless yields. That task would be all the simpler if the Senate ratified the threshold test ban treaty of 1974, which calls on both sides to trade geological and calibration data. Interestingly, in 1983 the Energy Department reverted to the selective test announcement policy of 1963–1975. Its excuses for withholding notification of nuclear tests range from the petty ("It takes a lot of work to announce each of those tests"), to the petulant ("It's not fair to tell all the U.S. tests while the Soviets don't announce any of theirs"), to the perverse (It doesn't want to help the Soviets "determine the detection limits they have").[21] Energy seems to be determined to keep verification as big a question mark as possible.



The B-61 tactical and strategic nuclear bomb, whose 1,800 parts come from 570 suppliers and are assembled by nine primary contractors. *(courtesy Los Alamos National Laboratory)*

In the 1980s, of course, the CTB has been supplanted by the nuclear freeze as the *bête noire* of the nuclear establishment. Energy takes the threat of a freeze—or, as Hoover has it, a "unilateral technological lobotomy" that would leave the United States "a model 'T' in the fast lane" of the arms race—no less seriously than it does the threat of an unfavorable balance in Wagner's U.S.-Soviet "image ratio." But, even if a freeze on testing is ratified, Energy is ready with a technical solution. With the technology of inertial confinement fusion, it hopes to be able to detonate miniature hydrogen devices in the laboratory.

In inertial confinement fusion (ICF) a tiny pellet the size of the eagle's eye on a quarter is filled with deuterium-tritium gas and bombarded with powerful laser or particle beams. If temperatures reach 100 million degrees and the pellet is compressed hundreds of times within a billionth of a second, a thermonuclear explosion with a yield of about 0.1 ton (200 pounds) results. Energy Department physicists are confident of achieving thermonuclear ignition within five to 10 years. At the outset of the program, in the early 1970s, there was much indecision whether ICF was an energy or a weapons program. Because ICF energy production is an engineer's nightmare—requiring injection of 10 fuel capsules per second into a laser reactor able to withstand a continuous chain of micro-Hiroshimas—the program is now devoted solely to realizing its near-term military potential.

That, according to Alexander Glass, president of KMS Fusion, a key ICF contractor for Energy, derives from the fact that "ICF provides a laboratory-scale phenomenon which exhibits much of the same physics as thermonuclear weapons. Additionally, the radiation, X-rays, and neutrons produced by an ICF target can be used to simulate the effects of nuclear weapons on defensive systems, supplementing the data currently obtained only through underground testing."[22] More important, as Lawrence Livermore's ICF prospectus puts it, "Along with these simulations, especially in the case of restricted testing or a CTB, experiments on these facilities offer challenging opportunities for nuclear weapons design personnel."[23]

The nuclear arms race is driven by a broad variety of factors: nationalism, paranoia, parochial domestic politics, and economic self-interest. The role played over the years by the Department of Energy and its predecessors highlights perhaps the most elusive and intractable of these motivating forces: sheer technological momentum. If avoidance of "technological surprise" dictates maintenance of a large cadre of weapons physicists and technicians, they will assuredly devise new, and invariably more destabilizing, weapons which will inevitably be deployed for the simple reason that they can be developed. Technological feasibility is automatically translated into military reality.

Arms controllers, recognizing the inherent difficulties in

constraining the relentless momentum of twentieth-century technology, term this insidious phenomenon "technology creep." Nuclear weapons designers, on the other hand, prefer to call it "progress." This technocratic approach to the nuclear dilemma has been tellingly encapsulated by George Dacey, president of Sandia National Laboratories: "I think my answer is a very simple one," Dacey replied when asked his views on the nuclear freeze. "If you mean by 'freeze' that you intend to stop thinking, to stop considering what the weapon possibilities are, what modern warfare can, in fact, become, then I think you are taking a dangerous risk with this country's security. From a technical standpoint I think there are enormous possibilities for improvement ahead. We do need to make it clear that such progress is in the public interest and that we should charge on at full speed."[24]

1. House Armed Services Committee, *DoE Authorization Legislation for FY 1983*, 97th Cong., 2d sess., April 26, 1982, pp. 46–47.
2. Ibid., p. 8.
3. House Armed Services Committee, *DoE National Security and Military Applications of Nuclear Energy Authorization Act of 1984*, 98th Cong., 1st sess., March 1, 1983, p. 49.
4. David Hoffman and Karen Klinger, "Weapons 'Establishment' Can Remake U.S. Policy," *Philadelphia Inquirer*, Oct. 28, 1979, p. 3G.
5. House Appropriations Committee, *Energy and Water Development Appropriations for 1985*, part 6, 98th Cong., 2d sess., March 13, 1984, p. 10.
6. House Armed Services Committee, *DoE National Security and Military Applications of Nuclear Energy Authorization Act of 1984*, 98th Cong., 1st sess., March 1, 1983, p. 55.
7. Senate Armed Services Committee, *DoE FY 1983 National Defense Programs Authorization*, 97th Cong., 2d sess., April 26, 1982, p. 77.
8. Senate Armed Services Committee, *DoE National Security and Military Applications of Nuclear Energy Authorization Act of 1984*, 98th Cong., 1st sess., March 1, 1983, p. 27.
9. Robert Scheer, "Teller's Obsession Becomes Reality in 'Star Wars' Plan," *Los Angeles Times*, July 14, 1983, p. A1.
10. Interview with author, April 17, 1984.
11. John McPhee, *The Curve of Binding Energy* (New York: Ballantine, 1973), pp. 56–57.
12. William J. Broad, "The Young Physicists: Atoms and Patriotism Amid the Coke Bottles," *New York Times*, Jan. 31, 1984, p. C1.
13. House Appropriations Committee, *Energy and Water Development Appropriations for 1984*, part 6, 97th Cong., 1st sess., March 8, 1983, p. 187.
14. Interview with author, April 30, 1984.
15. Edward Teller, *The Legacy of Hiroshima* (New York: Doubleday, 1962), p. 205.
16. House Armed Services Committee, *DoE National Security and Military Applications of Nuclear Energy Authorization Act of 1984*, 98th Cong., 1st sess., March 1, 1983, p. 27.
17. Sam Cohen, *The Truth About the Neutron Bomb* (New York: Morrow, 1983), p. 146.
18. Hoffman and Klinger, op. cit.
19. Herbert F. York, *Race to Oblivion: A Participant's View of the Arms Race* (New York: Simon and Shuster, 1970), p. 45.
20. Teller, op. cit., p. 196.
21. William J. Broad, "Some Atomic Tests Being Kept Secret by Administration," *New York Times*, Jan. 29, 1984, p. 1.
22. House Armed Services Committee, *DoE National Security and Military Applications of Nuclear Energy Authorization Act of 1984*, 98th Cong., 1st sess., March 1, 1983, pp. 68–69.
23. House Armed Services Committee, *DoE Authorization Legislation (National Security Programs) for FY 1983*, 97th Cong., 2d sess., April 27, 1982, p. 155.
24. Senate Armed Services Committee, *DoE FY 1983 National Defense Programs Authorization*, 98th Cong., 2d sess., April 26, 1982, p. 59.

Reshaping NATO nuclear policy

Dependence on U.S. nuclear protection has trapped NATO in a cycle of conflicting anxieties. The solution lies in strengthening the Alliance politically, while reducing reliance on the nuclear component of deterrence.

by Jane M.O. Sharp

ALL MILITARY alliances suffer a common security dilemma, namely the tensions induced by the risks of being abandoned by one's allies in a crisis and the risks of being entrapped in a conflict not of one's own choosing. This dilemma is exacerbated in NATO, with the West European allies oscillating between two contradictory fears: on the one hand that the United States will not be willing to carry out its threat of nuclear retaliation to a non-nuclear Warsaw Pact attack—because of the risk of a Soviet counterstrike on the U.S. homeland—and on the other, that the United States might resort to nuclear weapons too soon, try to limit nuclear warfare to Europe, and incinerate the continent in the process.

The dependent European allies seem to experience cycles of anxiety about U.S. leadership which typically have five stages:

- A loss of confidence in Washington is triggered by economic, political, or military anxieties. Problems can arise, for example, when the United States appears to export inflation, becomes enamored of repressive right-wing military regimes in the Third World, engages in extra-NATO military activities which could trigger conflict in Europe, or proposes weapons programs like the Sentinel and Safeguard anti-ballistic-missile systems in the 1960s and 1970s, and the current Strategic Defense Initiative, which suggest a Fortress America approach to defense planning. Particularly difficult problems to deal with are recurrent European anxieties that U.S.-Soviet arms control negotiations are being conducted at the expense of NATO defense interests.
- Allies seek reassurance from Washington and, in particular, look for signs of a renewed commitment to defend the political and territorial integrity of Western Europe. These anxieties are best dealt with in political currency. A good example was the Nuclear Planning Group, which Defense Secretary Robert McNamara established in the late 1960s to reassure Europeans troubled by a combination of nuclear worries, including the cancellation of the nuclear control sharing scheme and the discriminatory aspects of the Non-Proliferation Treaty.
- More often, however, the cycle moves to a third stage in which the response from Washington comes in the form of the latest nuclear hardware, raising tensions and complicating arms control efforts between East and West.
- This triggers stage four, in which fear of entrapment takes over from fear of abandonment as Europeans protest the new Cold War, excessive reliance on NATO's nuclear weapons, and the new risks of nuclear holocaust.
- Finally, Europeans encourage a new U.S.-Soviet rapprochement, in particular a return to serious arms control negotiations. If the ensuing detente generates more bilateral agreements, these may trigger a new round of European fears of abandonment.

To the extent that these cycles of anxiety are due to overreliance on U.S. nuclear weapons, one obvious remedy is for NATO to adopt a defense policy which relies less on the nuclear, and more on the non-nuclear, components of NATO's military force posture. This shift was indeed attempted on a number of occasions. The results, however, were only partially successful since the impetus for change usually came from the United States and was perceived by Europeans as yet another manifestation of the lack of U.S. commitment to the Alliance, thereby becoming part of the problem rather than the solution.

European governments' anxieties about no-first-use in the 1980s parallel official anxieties about NATO's shift from massive retaliation to flexible response in the 1960s:

- an unduly pessimistic view of the East-West balance of conventional forces;
- reluctance to allocate funds to improve non-nuclear forces because the task not only seems so enormous, but also suggests a willingness to contemplate a long conventional war;
- apprehension about U.S. resolve to use force in defense of Western Europe if it risks a retaliatory Soviet strike on the U.S. homeland; and
- apprehension about the risks of tampering with anything as fundamental as Alliance military doctrine.[1]

While not yet ready to accept no-first-use, and standing firm on the deployment of new intermediate-range nuclear missiles, NATO leaders nevertheless reached a consensus, in reaction to widespread protest against the decision to modernize intermediate-range nuclear forces (INF), that NATO must rely less on nuclear weapons. This was reflected in the NATO Shift Study undertaken at the instigation of the Dutch government, which resulted in the withdrawal of 1,000 warheads in connection with the December 1979 "double-track" INF decision and the October 1983 decision at Montebello to withdraw another 1,400. In addition, for

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each new INF warhead introduced in accordance with the December 1979 double-track decision, one old warhead will be removed. This still leaves some 4,600 U.S. nuclear warheads in Western Europe, and many NATO officials would like to remove more, especially those designated for nuclear artillery or other short-range, short-reaction-time, battlefield systems. Proposals to change NATO's flexible response doctrine to one of no-first-use continue to meet strong official opposition, however, and the issue will need to be thoroughly debated, particularly in West Germany, before any change can be expected.

Reassessing NATO's deterrence requirements

In both the 1960s and the 1980s, Robert McNamara and other NATO reformers believed that reducing reliance on nuclear elements of the force posture must be accompanied by a buildup of conventional forces. Indeed in November 1984, NATO adopted a new Follow-On-Forces-Attack concept that aims to make NATO conventional forces more effective in attacking rear-echelon Warsaw Pact forces in the event of a Soviet attack on Western Europe.[2] The move is controversial, however, since it appears to transform what were manifestly defensive NATO forces toward a more offensive posture, thereby threatening in peacetime one of the most basic Soviet security requirements: control over their East European buffer zone.

Both NATO reformers and their critics may seriously misjudge the requirements of extended deterrence in Europe by overestimating the level of military force, and underestimating the degree of political cohesion, necessary to deter possible Soviet adventurism in Western Europe. NATO planners appear to base Alliance force requirements, which determine and constrain NATO arms control possibilities, on several misplaced assumptions:

- that the Soviets have an uncontrollable desire to expand territorially westwards and would have invaded Western Europe long ago in the absence of the U.S. commitment to retaliate to a Warsaw Pact conventional attack with nuclear weapons;
- that the credibility of this retaliatory threat requires nuclear forces at least in balance with, and preferably superior to, those of the potential aggressor; and
- that the American people will continue to support the effort to maintain nuclear superiority over the Soviet Union and the threat to initiate the first use of nuclear weapons since Hiroshima and Nagasaki.

These three assumptions drive force requirements and, if correct, actually preclude effective arms control. Under these conditions the negotiation process will continue to be more competitive than cooperative, the allies will continue to suffer cycles of anxiety about the U.S. nuclear umbrella, and the special interests opposed to arms restraint will continue to hamper U.S. arms control efforts. In the mid-1980s, however, all three assumptions need to be reexamined.

Paul Valerry, West Germany

IN THE EARLY 1950s, fear that the Korean War presaged a Soviet move into Western Europe was the primary stimulus behind the conventional rearmament of the NATO countries.[3] Since then, however, apart from some pressure on West Berlin in the late 1950s and early 1960s, there is little evidence that the Soviets have had either the opportunity or the urge for territorial aggrandizement westwards.

On the contrary, since 1945 the Soviet leadership has been preoccupied with the effort to consolidate Eastern Europe as both a security and an ideological buffer against military threats and destabilizing influences from the West.

Maintaining control over Eastern Europe has been the sine qua non of Soviet security policy, but has proved to be an extremely demanding requirement. Occupation costs, together with the economic subsidies to maintain even the minimum living standards necessary to establish a modicum of legitimacy for the ruling communist parties, make Eastern Europe as much an economic and military liability for Moscow as it is a political asset. This suggests that the next generation of Soviet leaders will be at least as likely as the post-war generation has been to limit their role in Europe to preventing any outside interference with either their military or political control over the Warsaw Pact states.

Keeping the Soviets out of Western Europe may well be a much less demanding task than NATO planners now

Nuclear explosives are not usable military weapons and should not be treated as such either by making plans for their use in battle or insisting that nuclear arms control agreements be balanced.

assume. Here, as elsewhere, a threat that deters is more credible than a threat that compels, since the would-be aggressor must suffer the initial burden of risk. In the late 1940s, for example, the Western powers were deterred from pushing the Soviets out of Eastern Europe—despite a U.S. nuclear monopoly—by the prospect of engaging Stalin's war-torn armies in conventional battle.[4] For a nation as averse to risk as the Soviets have proved to be, any move into Western Europe would have to be a last-ditch effort to avert the imminent collapse of Soviet control over Eastern Europe or an imminent attack from the West. Even under those circumstances, Soviet planners contemplating military action would have to weigh not only NATO's capability to resist attack, but also the U.S. resolve to defend its sustained interest and substantial investment in the territorial and political integrity of Western Europe.

Rather than focusing exclusively on military capabilities—both the Soviets' to attack and NATO's to resist—NATO leaders should be more sensitive to the dangers of political disarray in the Alliance. Today, as in the prenuclear era, the degree to which great powers see any advantage in initiating military activity against each other's allies rests largely on the perception each has of the other's capability and resolve to defend its protégés. When an alliance appears cohesive, there is less temptation to attack its member states militarily or probe alliance differences politically. If the interests of alliance members begin to diverge, however, an adversary is tempted to exploit the rift by intervening in intra-alliance debates on sensitive issues, setting off one ally against another and undermining alliance cohesion. This tendency is manifest in both Soviet behavior toward NATO and U.S. behavior toward the Warsaw Pact.

Thus, even as he denounced strikes by air traffic controllers at home, President Reagan enthusiastically supported strikes by the independent Polish trade union Solidarity. Industrial unrest in Poland not only challenged communist party rule in that country, but also tended to undermine Soviet control over Poland in particular and over Eastern Europe generally. Similarly, as West Europeans took to the streets to protest their governments' willingness to provide bases for the new U.S. cruise and Pershing II missiles (mandated by NATO's double-track decision of December 1979), the Soviets stepped up their carrot and stick campaign against NATO by threatening dire retribution against those states which accepted the new missiles, and less drastic treatment for nuclear-free states. With East German communist party leader Erich Honecker assigned a key role, the Soviets also orchestrated a campaign against the INF deployments in West Germany, intervening in the March 1983 federal elections with clumsy and ultimately counterproductive tactics.

In an extreme case, alliance interests could diverge so far that one superpower would appear to have abandoned its commitment to defend its allies' interests. An adversary might then be tempted to go beyond political mischief and initiate military actions against a weak and abandoned protégé, confident that the guarantor state would not retaliate. An alliance in disarray could thus tempt a would-be aggressor to act militarily in a crisis.

The threat of nuclear retaliation would not be an insignificant factor in deterring Soviet adventurism. Nevertheless, NATO's cohesion, in terms of effectively integrated forces and common political and economic interests between the United States and Western Europe, is the crucial component of the Western deterrent. NATO policy should therefore concentrate both on increasing political cohesion in the Alliance and on removing any temptation for Soviet military action in a crisis. This objective should inform both Alliance force planning and Alliance diplomacy at the two multilateral negotiations on European security: the interalliance talks in Vienna on Mutual and Balanced Force Reductions, and the pan-European Conference on Security and Confidence Building Measures in Stockholm.

For the United States this means, above all, conducting a foreign policy which makes U.S. interest in defending the integrity of Western Europe unambiguous, so as not to tempt the Soviets. This means eliminating as far as possible transatlantic squabbles about trade and monetary policy, defense burden sharing, and technology transfers to the Eastern bloc. It also means abstaining from patterns of deployment in Western Europe that suggest an offensive-looking NATO posture which might threaten Soviet control over

Eastern Europe. Few if any West European governments want anything but the most gradual evolution in Eastern Europe, and to suggest by deep-strike force postures or inflammatory rhetoric either the capability or the intention to change the political or territorial status quo in Eastern Europe by force is not only provocative to the Soviets but profoundly unsettling to West Europeans.

U.S. POLICY has rested on the assumption that the credibility of its security guarantee to NATO requires nuclear forces at least in balance with and preferably superior to those of the Soviet Union. Indeed this is the primary motor which drives the acquisition and modernization of the U.S. nuclear arsenal. That assumption is strengthened by the traditional arms control process which seeks balanced agreements with reciprocal rights and obligations and is mirrored by the Soviet preoccupation with maintaining parity with the United States to demonstrate a positive correlation of forces in favor of the socialist camp.

If balance makes any sense, however, it can only be in militarily useful systems. Yet, four decades into the nuclear era and despite the best efforts of civilian strategists and game theorists, the military have not been able to devise any rational mission for nuclear explosives. Neither military nor political purposes can be served by escalating from nonnuclear to nuclear use.[5] The devastation from blast, heat, and radiation is too immense, and the costs of a nuclear war unimaginable. Studies by atmospheric scientists suggest the possibility of catastrophic global effects on climate from massive emissions of smoke and toxic chemicals following a major nuclear exchange. Thus, regardless of relative capability, we have a state of what McGeorge Bundy has called "existential deterrence." These risks will not go away, nor will they be materially changed by advances in technology, fluctuations in relative nuclear capability, or changes in military doctrine on either side. This is the essence of the nuclear revolution.[6]

If nuclear explosives have no military utility, and their only practical purpose is for deterrence, this can be achieved by a force of a few hundred warheads at most, each of which can credibly threaten to destroy a city. To be deterred from provoking what would be a devastating retaliatory strike, the would-be aggressor only needs to know that this deterrent force is invulnerable. Some analysts claim that while such a force might be sufficient to deter a direct nuclear attack on the United States, it would not necessarily serve to deter a Warsaw Pact conventional attack on Western Europe. But, as Denis Healy observed in the 1960s, credibility is not symmetrical between potential attackers and defenders. A 95 percent likelihood that the United States would respond to a conventional Warsaw Pact attack with nuclear weapons might not be enough to reassure West Europeans of the U.S. commitment, but only a 5 percent chance of such a response could be more than enough to deter the Soviets.[7]

Yet far from coming to terms with our permanent vulner-

ability, NATO strategists vainly try to refine Alliance doctrine by searching for implementable threats. In particular, strategists have tried to move away from the apparently immoral threat to target the adversary's civilian populations, to the seemingly more benign strategy of targeting the enemy's military forces. But the distinction between countercity and counterforce targeting is not operationally feasible. Despite recent attempts to produce smaller, "cleaner" nuclear explosives, any effective nuclear counterforce strike would also kill unacceptably large sections of the population and could hardly be viewed as "limited" by the state under attack.

The fact that nuclear weapons are simply too powerful to be used must be faced and the logical conclusions drawn:

- Nuclear superiority is not military superiority; it is simply nuclear superiority.
- Deterrence of aggression by other nuclear powers requires only a few hundred nuclear explosives based on invulnerable delivery vehicles. Beyond this absolute capability, relative nuclear strength is irrelevant to our security and the security of our allies.
- The search for nuclear balance is meaningless; there is nothing irresponsible, or dangerous, about reducing redundant nuclear systems unilaterally.
- Nuclear explosives cannot substitute for conventional forces and in no way compensate for conventional inadequacy.
- Reducing current nuclear arsenals does not imply a reduction in military capability and does not require any compensatory increase in conventional strength. On the contrary, removing nuclear weapons commingled with NATO ground forces will actually increase the conventional capability of those units by releasing manpower currently occupied with the custody of nuclear warheads.

NATO reformers and their critics may seriously misjudge the requirements of deterrence in Europe by overestimating the level of military force and underestimating the degree of political cohesion necessary to deter possible Soviet adventurism in Western Europe.

SINCE ITS inception, NATO doctrine and force planning have been in the hands of a relatively small community of defense experts. Politically, the strongest transatlantic bonds are among British, West German, and U.S. officials and analysts of the center-right, with an especially conservative coterie dominating policy in the late 1970s. This group formulated NATO's double-track decision to modernize and control intermediate-range nuclear forces.

But public outcry against the decision to deploy 572 new INF warheads on cruise and Pershing II missiles in Western Europe—capable of striking Soviet targets—demonstrated the wide disparity between the experts' and the public's view of what couples the United States to Western Europe. The experts claimed that the new missiles would ease NATO's fears of abandonment by tying U.S. and West European security more closely together. By contrast, most Europeans believed that the cruise and Pershing II missiles increase the risk of nuclear war by presenting attractive targets to Soviet forces: a classic fear of entrapment to which the experts seemed quite insensitive. These European anxieties were not eased when the Reagan Administration eventually began to implement the negotiation side of the double-track decision. On the contrary, the manifest lack of interest in Washington in concluding an equitable INF agreement made it clear that the earlier promise of negotiations had been primarily a fig leaf for deployments.

A number of retired officials, from government and military service in NATO countries, are among the new nuclear skeptics. They complain of many aspects of NATO policy, including the fact that nuclear war-fighting plans are dangerously unrealistic, that targeting policy and military training tend to dehumanize the adversary, that inside assessments of the Soviet threat do not sufficiently take into account Soviet security requirements, and that NATO's nuclear emphasis is often at the expense of prudent conventional force planning.

The nuclear freeze movement, the new activism in professional and religious groups, and the U.S. Catholic bishops' letter, as well as the various facets of the antinuclear movement in Western Europe, raised public consciousness on the nuclear issue on both sides of the Atlantic. Public opinion surveys revealed substantial majorities opposing NATO's nuclear policies in the early 1980s. Most of those polled in NATO Europe, for example, opposed the deployment of new cruise and Pershing II missiles.[8] In the United States, surveys showed a massive shift in sentiment from the 1950s, when most Americans believed nuclear weapons served the cause of peace, to current fears that Soviet and U.S. nuclear arsenals are increasing the risk of war and eroding international security.[9]

In the mid-1950s, most Americans felt that it was justified to retaliate with nuclear weapons to a non-nuclear Soviet attack on Western Europe. In 1984, by contrast, 77 percent of those polled said the United States should not initiate the use of nuclear weapons in response to a conventional attack on the Allies, and 74 percent believed that nuclear weapons should never be used in a battlefield situation. Most Americans seemed unaware that current NATO policy threatens the first use of nuclear weapons. In one survey 81 percent of those polled believed that it is U.S. policy to use nuclear weapons only if the Soviets use them first.

In the 1950s, most Americans felt that nuclear superiority enhanced national security. In 1984, they understood that the Soviets had caught up, and would build to keep up, so that regaining U.S. superiority was no longer a feasible op-

tion. More than 75 percent accept this nuclear stalemate and support a bilateral nuclear freeze as the best route to getting nuclear weapons under control, while 61 percent see no risk in a unilateral moratorium on new U.S. systems, hoping the Soviets would follow suit. Finally, in contrast to earlier surveys, most Americans now believe that acquiring extra nuclear weapons as bargaining chips for negotiations is counterproductive, serving only to generate Soviet countermeasures.

The impact of all this antinuclear sentiment is hard to gauge. In the United States, the House of Representatives voted against the MX missile in 1982 and endorsed the nuclear freeze in 1983, as did the 1984 Democratic Party platform. But only a few legislators supported efforts to delay INF deployments in 1983. NATO leaders claim to be reducing reliance on nuclear weapons, but talk of modernizing battlefield weapons even as obsolete ones are being withdrawn. Furthermore, the restructuring of conventional forces to conform with the Follow-On-Forces-Attack concept could generate as many problems in East-West relations as it was supposed to solve within the Alliance.

Election results in the United States suggest that most nuclear freeze proponents vote their pocketbooks and their ambivalence about the Soviet Union, rather than their anxieties about nuclear war. In Britain and West Germany the most recent national elections were also won by conservatives committed to free enterprise, a tougher stand toward the Soviet Union, and no delays in INF deployment. It should be noted, however, that the main opposition parties —the Democratic, Labour, and Social Democratic Parties— in all these elections were those which, when in office in the late 1970s, had either called for—or approved—new land-based nuclear missiles in Europe which could strike Soviet targets. So voters in these three countries were hardly offered convincing alternatives or attractive choices on the nuclear issue.

If the antinuclear impact on the ballot box was mixed, the INF decision and subsequent protest nevertheless had a disturbing effect on Alliance cohesion. Polling data suggest that antinuclear sentiment is far from synonymous with anti-NATO sentiment. Nevertheless, much of the opposition to INF was bitterly anti-American and did raise transatlantic hackles as the European left and the American isolationist right reinforced each's stereotype of the other. In the United States, this generated a new crop of congressional resolutions calling for the withdrawal of U.S. troops from Europe, and complaints that the Europeans were not carrying their share of the NATO burden. In Western Europe the INF debacle—in both its Carter and its Reagan phases —contributed to the decline in respect for U.S. leadership in world affairs, and a growing skepticism and weakened attachment to NATO among the more highly educated.

NATO governments, by and large, continued to support and implement the INF decision despite growing opposition in those states designated to receive the new missiles, but they often did so with embarrassingly close margins in their legislatures.

In West Germany, Chancellor Helmut Schmidt first raised the alarm about a eurostrategic imbalance in the mid-1970s and supported the INF decision while in office. In opposition, however, Schmidt's Social Democratic Party denounced INF deployments in 1983 and endorsed a no-first-use policy for NATO in May 1984. Greece dissociated itself from the INF decision, the Netherlands and Belgium voted to delay deployment of their allotted share of cruise missiles, and Denmark voted against paying its share of the INF infrastructure costs. In Britain, Prime Minister Margaret Thatcher's government held firm, but the Labour Party opposition —despite the Callaghan government's having approved the cruise in the 1970s—condemned the INF decision in the early 1980s and vowed to remove cruise and Pershing missiles if and when they returned to office. In the summer of 1984 the British Liberal Party broke ranks with its Social Democratic Party partner to condemn INF, voted against continuation of an independent British deterrent, and endorsed a no-first-use policy for NATO.

SEVERAL POLICY recommendations emerge from this analysis of the Alliance arms control dilemma and the requirements for extended deterrence:

• European anxieties about the U.S. commitment to NATO are best assuaged by political rather than military measures. This is because the collective security of NATO rests at least as much on political cohesion as on strictly military capabilities.

As long as NATO relies heavily on the nuclear component of its force posture, bilateral U.S.-Soviet efforts to control nuclear systems will continue to trigger fears of abandonment in some Europeans, and attempts to ease these fears with nuclear hardware will inevitably trigger fear of entrapment, a new bout of anti-Americanism, and intra-alliance tensions. European calls for reassurance should therefore be dealt with politically. In the arms control context this will mean either improving intra-alliance consultations or bringing the Allies directly into the negotiations so that they share responsibility for the outcome. The long-term solution, however, is to recognize that nuclear weapons have always been divisive in Alliance politics, that nuclear explosives cannot defend territory and certainly cannot defend heavily urban Western Europe, and that far from enhancing NATO's deterrent capability, land-based nuclear systems on the continent are more likely to provoke Soviet preemption in a crisis.

- NATO doctrine should recognize that nuclear weapons can only serve a deterrent function, for which balanced nuclear forces are not required. NATO should decide on the absolute level of its deterrent force and withdraw redundant systems in as orderly a manner as possible, preferably in cooperation with the Soviet Union, but recognizing that unilateral reductions need not undermine either U.S. or West European security. Nuclear explosives are not usable military weapons and should not be treated as such either by making plans for their use in battle or insisting that nuclear arms control agreements be balanced.
- More useful than a formal no-first-use declaration would be acceleration of the current trend toward a NATO force posture that implies no-early- or very-unlikely-use. Nuclear battlefield systems, and eventually all land-based nuclear forces, could be removed from Western Europe, while retaining the option of first-use of centrally or sea-based U.S. strategic systems. This threat would still be a powerful deterrent to Soviet military moves in a crisis, and such a posture would be less likely to generate European fears of abandonment than a formal declaration of no-first-use. Yet, removing provocative and vulnerable land-based systems should ease any fear of entrapment caused by the prospect of too early use.
- In reducing reliance on the nuclear component of the deterrent, NATO planners should not make the non-nuclear component more offensive. This is the risk inherent in the current proposal for a NATO declaration on no-first-use of nuclear weapons, since it is usually coupled with a call for stronger conventional forces. Proponents claim that the threat of first use has lost its former credibility since U.S.-Soviet parity makes any nuclear use suicidal. For West Europeans still leaning on the nuclear crutch, however, no-first-use triggers fears of abandonment in the event of a Soviet attack. Ideally, then, the shift to no-first-use should be preceded by an agreement setting limits on Soviet manpower in Eastern Europe. Pulling back both sides' armored divisions would further reduce the offensive threat to both halves of Europe and make no-first-use still more acceptable. This kind of restructuring might be difficult to achieve by contractual limits because the compliance obligations would be asymmetrical. Nevertheless, it is the kind of mutual offsetting of asymmetries that ought to be discussed, both at the Mutual and Balanced Force Reduction talks in Vienna and at the European Security Conference in Stockholm.
- Any major reductions of U.S. nuclear weapons in Western Europe should be accompanied by a reaffirmation of the commitment to keep U.S. ground forces on the continent and to participate fully in NATO's integrated military command. This is not because the European members of NATO could not make up the military shortfall if the U.S. 7th Army withdrew—obviously they could—but because the most important component of peacetime deterrence is the U.S. commitment to the political and territorial integrity of Western Europe, and U.S. troops are the most visible evidence of that commitment.
- Political leaders should be aware that public opinion on both sides of the Atlantic is ready for bolder steps to reduce the danger of nuclear war. The most impressive arms control achievements to date—the Limited Test Ban Treaty, the ABM Treaty, and the Biological Weapons Convention—came not from initiatives from the so-called experts, but primarily from strong grassroots pressure and from political leaders willing to take bold unilateral initiatives. The current generation of Western leaders should take the public pulse more carefully and move ahead with dispatch not only to negotiate agreements with the Soviets to preclude deployment of the next generation of nuclear weapons, but also with plans to dismantle those currently deployed systems which are redundant. □

1. Jane Stromseth, "Prospects for a Conventional Defence of Western Europe: Some Lessons From the 1960s," *Proceedings of the 32nd Pugwash Conference on Science and World Affairs,* Warsaw: August 26–31, 1982, pp. 370–74.
2. William Beecher, *Boston Globe,* Nov. 10, 1984; and "Fee, Fi, Fofa, Hm," *The Economist* (Nov. 24–30, 1984), pp. 47–48.
3. Louis P. Halle, *The Cold War as History* (New York: Harper and Row, 1967).
4. Michael McGwire, "Dilemmas and Delusions of Deterrence," *World Policy Journal,* 1, no. 4 (Summer 1984), pp. 745–68.
5. John Marshall Lee, "The Use of Nuclear Weapons" (Paper presented at the Prospects for Peacemaking Conference, Hubert Humphrey Institute, Minneapolis, Nov. 29, 1984); and Michael Carver, "No-First-Use: A View From Europe," *Bulletin,* 39, no. 3 (March 1983), pp. 22–26.
6. Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, New York: Cornell University Press, 1984), especially chapter six, pp. 147–170.
7. Bruce Reed and Geoffrey William, *Denis Healey and the Policies of Power* (London: Sidgwick and Jackson, 1971), p. 142.
8. See Bruce Russett and Donald R. Deluca, "Theater Nuclear Forces: Public Opinion in Western Europe," *Political Science Quarterly,* 98, no. 2 (Summer 1983), pp. 179–96; David Capitanchik, "Public Opinion and Nuclear Weapons in Europe," *Arms Control,* 4, no. 2 (September 1983), pp. 111–33.
9. See Bernard M. Kramer, S. Michael Kalick, Michael A. Milburn, "Attitudes Toward Nuclear Weapons and Nuclear War: 1945–1982," *Journal of Social Issues,* 39, no. 1 (1983); Daniel Yankelovich, et al., *Voter Options on Nuclear Arms Policy* (New York: The Public Agenda Foundation, 1984); Daniel Yankelovich and John Doble, "The Public Mood," *Foreign Affairs,* 63, no. 1 (Fall 1984), pp. 33–46.

Who controls NATO's nuclear weapons?

In spite of elaborate consultation procedures, host nations still have only an informal veto over the use of most U.S. nuclear weapons in Europe, and the circumstances that would justify a nuclear launch are not spelled out.

by Daniel Charles

NATO'S REVISED fighting plans, as announced last November, put greater emphasis on attacking Warsaw Pact forces deep in their own territory. This "deep strike" strategy is to be carried out with conventionally armed aircraft or missiles and has given rise to speculation that NATO intends to reduce its dependence on nuclear weapons.

Alliance officials deny this. Indeed, the continuing deployment of Pershing II and cruise missiles in Europe and congressional approval of production of a new nuclear artillery shell to be deployed in Europe indicate that NATO is not about to extricate itself from its nuclear dilemmas.

Perhaps the most politically sensitive question raised by the presence of American-controlled nuclear weapons in Europe is that of who decides when and how they are used. During the 30 years since these weapons began to arrive on their territory, European governments have tried, with increasing success, to gain some control over their use. While they have generally relied on quiet pressure and diplomatic channels within NATO, the issue has occasionally broken into public view, most recently during the debate over Pershing II and cruise missile deployment in West Germany and Britain in 1983.

Oskar Lafontaine, mayor of Saarbrücken and a leading figure in the West German Social Democratic Party (SPD), has been among those calling for a revision in the present NATO arrangements. "I consider it intolerable, comrades, that the American president alone can decide on the use of nuclear weapons in our country," he said in a speech to a 1983 Party convention. While pressure for a guaranteed German veto over use of nuclear weapons based on German soil has come primarily from the Social Democrats, some conservative figures, such as former Defense Minister Franz-Josef Strauss, have also suggested dual-key arrangements.

In Britain, the debate also resurfaced in 1983, when the Labor, Social Democratic, and Liberal Parties called for dual-key control over the cruise missiles to be stationed in their country. Former Defense Minister Denis Healey, who had been deeply involved in the formation of the very NATO consultation process he was now calling inadequate, led the critics of the cruise missile deployment decision.

The Labor defense spokesman reminded his listeners of the U.S. failure to consult with Britain before invading Grenada for the professed purpose of protecting a few U.S. citizens in that country. "Last week," said Healey, "the United States brushed the United Kingdom aside when the threat was vague and distant. Do the Secretary of State and the Prime Minister really believe that the United States Administration, certainly under this President, would take any notice when the threat was to thousands of American soldiers in Europe? They would not."[1]

CONSULTATION PROCEDURES do exist within NATO to insure that neither the United States nor Britain uses its nuclear weapons against the will of NATO allies from whose territory they would be launched, or on whose territory they might explode. These procedures have their roots in the revision of NATO doctrine which began in the early 1960s under U.S. Secretary of Defense Robert McNamara.

In 1962, at a meeting in Athens, McNamara challenged NATO's doctrine of massive retaliation and called for increased attention to the Alliance's non-nuclear forces. He also criticized independently controlled European nuclear

The Pershing II missile. Public debate over deployment of the Pershing II and cruise missiles in Europe has focused attention on NATO consultation procedures for use of nuclear weapons.

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Robert S. McNamara, U.S. secretary of defense from 1961 to 1968, instigated NATO consultation procedures for nuclear weapons use as part of the move from massive retaliation to the flexible response doctrine. *(U.S. Army)*

forces and advocated closer consultation within the Alliance on nuclear policy. At that meeting, both Britain and the United States promised to consult their allies, time and circumstance permitting, before using those weapons.

In 1966, again at the instigation of McNamara, a small group of defense ministers from the United States, Great Britain, West Germany, Italy, and Turkey met four times for the most intense and wide-ranging discussion of nuclear issues that the Alliance had yet seen. European enthusiasm for this new consultative forum, called the McNamara Committee, led to the permanent establishment within NATO of the Nuclear Planning Group in 1967. Since April of 1967, the Group has met at the ministerial level twice a year to discuss general nuclear policy.[2]

The establishment of the Nuclear Planning Group helped, at that time, to defuse pressures for actual sharing of physical control over nuclear weapons within NATO. An earlier proposal for introducing the Europeans to the nuclear club —the multilateral force (MLF)—had collapsed during the 1960s.

Early in 1969 an Anglo-German paper on guidelines for the initial use of nuclear weapons was ready for submission to the Nuclear Planning Group. It reviewed all conceivable scenarios and possible objectives to be accomplished by such use. This Healey-Schroeder Paper, named for the British and German defense ministers, emphasized the role of nuclear weapons as political instruments of deterrence rather than actual means of fighting a war, and insisted on the necessity of maintaining the closest possible political control over their use.[3]

American criticism of the paper chiefly concerned the possible scale of initial use. The Healey-Schroeder paper emphasized limited or demonstrative nuclear use options. In view of the potential Soviet response to any NATO nuclear use, U.S. planners wanted to keep open the option of a large-scale initial use of hundreds of nuclear weapons.

After integration of numerous amendments, the paper, now called "Provisional Political Guidelines for the Initial Defensive Tactical Use of Nuclear Weapons by NATO," was adopted by the NATO ministers in November 1969. At the same meeting, the various agreements and operational practices regarding nuclear release procedures were combined in a single set of guidelines and adopted. Under these guidelines, special weight in any nuclear use decision is to be given to the countries providing the warhead, the delivery system, and the territory from or on which the weapons would be used. The condition—"time and circumstances permitting"—was retained.[4]

In addition to the U.S. nuclear warheads placed under NATO command, these guidelines cover all British nuclear weapons, which are under the command of the Supreme Allied Commander, Europe (SACEUR), except in case of a British national emergency. French nuclear weapons are not integrated in this consultation process.

According to General Bernard Rogers, the present Allied Commander, NATO guidelines require him to request the release of nuclear weapons before NATO loses the cohesive-

Gen. Bernard Rogers, Supreme Allied Commander, Europe, would be responsible for requesting the release of nuclear weapons under certain battlefield conditions. Such requests may also be made by the U.S. president. *AP/Wide World*

ness of its defense, which means several deep penetrations by opposing forces. How quickly might that occur? In public, Rogers will only say "fairly quickly," or "in days, rather than weeks." In a meeting with ambassadors to NATO, as reported in the November 21, 1984 *Washington Post*, he used an estimate of five to seven days.

NATO guidelines call for general consultation to begin at the earliest possible stage in a crisis. Any request for release of nuclear weapons from Rogers would go to the NATO Defense Planning Committee, to all NATO ministers of defense, and especially to the two participating nuclear powers, the United States and Britain.[5] "But prior to that time there would have been a warning message that I was probably coming to ask for release," Rogers told the U.S. Senate in 1983. "And even prior to that, in order to get the political authorities thinking in terms of giving this permission, I would have sent what I would call an 'early notification' message to them. So there is a series of steps taken."

Direct consultation regarding possible nuclear use would occur within the Defense Planning Committee of NATO. But the final decision would be made by the nuclear power itself, most likely the United States. Apparently, the practice in these consultations is to give the country from whose territory the weapon would be launched the right to veto the initial use of nuclear weapons. These procedures are practiced annually at the NATO WINTEX command post exercises.[6]

The 1976 Army Field Manual FM-100-5 contained a chart showing the release procedure and an estimate of how much time it might take. Including the time needed for transmission of the request from the corps level to NATO headquarters, then to political authorities, then back down to the actual delivery system, the estimate was that the entire request and release sequence would take 24 hours. This is obviously a very rough estimate; if less time were required for the decisions, the process would be much shorter.

Release would not necessarily follow from a battlefield request. As revealed in 1980 congressional hearings, formal procedures have been implemented to allow for a "top down" release, in which the political authorities release nuclear weapons without a formal request from the Allied Commander.

DISPUTES AROSE during the late 1960s in both the McNamara Committee and the Nuclear Planning Group concerning the purpose and type of initial nuclear use. These do not appear to have been completely resolved in the intervening years.

The Allied Commander has a wide range of nuclear options, including tactical strikes, limited demonstrative use,

or missile and air strikes throughout Eastern Europe and the Soviet Union. All of these options, however, present NATO with old dilemmas. Extensive tactical use of nuclear weapons on the battlefield is tantamount to "destroying the country in order to save it," and can hardly be acceptable to any German government. There have been recurrent reports of persistent German disagreement with U.S. support for large-scale initial use of battlefield nuclear weapons.

Demonstrative use of a limited number of weapons, on the other hand, invites massive nuclear retaliation and foregoes whatever military advantage one could conceivably gain from first use of nuclear weapons. Nuclear strikes against key command, control, communications, and intelligence (C³I) facilities deep in Warsaw Pact territory or in the Soviet Union, meanwhile, could mean immediate escalation to a strategic nuclear exchange—something the United States would want to avoid at all costs.

These differences could become the background for a NATO crisis if the Alliance were confronted with a decision on nuclear first use.

DESPITE ALL THE consultation mechanisms NATO has devised, the final control over U.S. nuclear weapons rests with the United States. And Europeans, not surprisingly, have periodically expressed doubts about the wisdom of this arrangement.

The Thor missile, provided to Britain in 1958, was in fact furnished with a dual-key mechanism. U.S. nuclear warheads deployed with delivery systems of other NATO allies, such as West Germany's Lance missiles and 155-millimeter artillery guns, also have a form of dual control. But no such arrangements are in place for well over half of the U.S. nuclear warheads in Europe.

Allied governments publicly profess confidence in the reliability of the present consultative procedures. British Defense Minister Michael Heseltine has asserted that the effect of the arrangements and understandings covering U.S. nuclear weapons in Britain "is that no nuclear weapon would be fired or launched from British territory without the agreement of the British Prime Minister." And he concluded: "The House will realize that for 30 years every British Prime Minister has been convinced that those assurances were absolute."[7]

The West German government also maintains that existing consultation procedures are sufficient, in that they provide West Germany with an effective veto over nuclear use. A formal veto, say German officials, is not desirable, since it could render the Federal Republic vulnerable to Soviet pressures. These arguments are somewhat contradictory, since West Germany would in any case be susceptible to such pressure if existing procedures amount to a veto.

According to Social Democratic Party defense spokesman Karsten Voigt, the possibilities for Soviet blackmail may be even greater without a veto. In a crisis, the West Germans would be susceptible to Soviet propaganda that their country was being left in the dark about American nuclear plans. Trust in the Alliance and popular loyalty to NATO would thus be undermined.[8]

The Social Democrats have not officially adopted this position, however, out of concern that an explicit German veto would be perceived as a gradual move toward German control over nuclear weapons. The Green Party has no interest in a nuclear veto arrangement; it demands the removal of all nuclear weapons from German soil.

AS LONG AS IT remains technically possible for the United States unilaterally to release and employ its European-based nuclear weapons without permission from the NATO allies, some nagging doubts about the credibility of U.S. assurances on consultation will remain. The phrase "time and circumstances permitting" still conditions the NATO guidelines on consultation. Increasing European assertiveness in defense matters, evidenced by the recent revival of the West European Union, may also have some effect on the Alliance's nuclear policy.

The United States' present control over its European nuclear forces is emphasized by the dual command structure which it maintains in Europe. General Rogers is both commander of NATO's military forces, and commander of U.S. forces in Europe. Testifying before Congress in 1981, Rogers said:

> This dual role allows us to fulfill our NATO commitment and additionally provides the flexibility to act unilaterally, when and if such action is in our national interest. U.S. European Command has been directed on more than one occasion to act unilaterally to advance U.S. national interests. Under the North Atlantic Treaty, were all U.S. forces assigned to NATO and not simply earmarked for eventual NATO use, the U.S. would lose this flexibility.

In view of the awesome consequences that the deployment and eventual use of nuclear weapons could have for the countries where these weapons would be employed, political pressures in these host nations for consultation and co-determination will continue to play a significant role in the Alliance. A credible system of consultation on nuclear policy and weapons release is a political requirement for NATO. As these procedures are strengthened, they should eventually include a formal veto of each nation over use of the nuclear weapons based on its territory. □

1. *Parliamentary Debates* (Commons), "Intermediate Nuclear Forces" (Oct. 31, 1983).
2. David Schwartz, *NATO's Nuclear Dilemmas* (Washington, D.C.: Brookings Institution, 1983).
3. Michael Legge, *Theater Nuclear Weapons and the NATO Strategy of Flexible Response* (Santa Monica, California: RAND, 1983).
4. Ibid.
5. "U.S. Security Issues in Europe: Burden Sharing and Offset, MBFR and Nuclear Weapons," staff report to the U.S. Senate Committee on Foreign Relations, 1973.
6. Michael Legge, op. cit.
7. *Parliamentary Debates*, op. cit.
8. Karsten Voigt, "Mehr Rechte für die Bundesrepublik?" in *Neue Gesellschaft* (April 1984).

Religious, scientific leaders on arms race

by Theodore Hesburgh

IN THE SPRING of 1981, Tom Malone, then foreign secretary of the National Academy of Sciences, suggested that it might be a good idea to get scientific and religious leaders together worldwide to make common cause against the nuclear threat to humanity. Several months went by until I was able to persuade Cardinal König of Vienna to join me in inviting the heads of the Science Academies of Japan, India, France, the United Kingdom, West Germany, the United States, the Soviet Union, China, and the Pontifical Academy to meet in Vienna to discuss Malone's idea. Most of them came, except the Chinese delegation, and met February 15–17, 1982. Yevgeny Velikhov and G.K. Skryabin of the Soviet Union, Spurgeon Keeny and Victor Weisskopf of the United States, M.G.K. Menon of India, and Carlos Chagas, the Brazilian president of the Pontifical Academy, became constant attenders at succeeding meetings.

Three meetings later, we had elaborated a five-page draft statement on the nuclear threat. In September 1982, we invited the presidents of the 36 most important National Academies to a meeting at the Vatican to discuss and approve the final scientific statement to be distributed to religious leaders worldwide for their discussion and comment. Over 20 of the presidents came, and more than 30 academies were represented. Frank Press, Charles Townes, Walter Rosenblith, David Baltimore, Keeny, Howard Hiatt, Tom Malone, and I were there from the United States. Delegates from six East European countries attended, with Velikhov again representing the Soviet Union. After two days of intense discussion, we unanimously approved a strong statement which we delivered to Pope John Paul II when he attended our final session. He encouraged us to deliver it also to all religious leaders of the world. In the United States we published the full statement in *Science* and in the *Bulletin* (December 1982); in the Soviet Union three million copies were reproduced in their most popular scientific and technical magazine.

The fifth meeting, mostly of religious leaders from as far away as India and Yemen, was held again with Cardinal König in Vienna. Keeny, Weisskopf, Hiatt, Velikhov, and others were also there to explain the scientific statement. From this meeting came a shorter statement by leaders of the major religious traditions, including the top Protestant and Catholic leaders in America, giving a new and strong dimension to the scientific statement. Both statements were then distributed worldwide.

Last summer I personally delivered both statements, in Chinese, to the president, vice-presidents, and secretary general of the Academia Sinica in Beijing with the request that they discuss and, hopefully, endorse it. Copies in Japanese and Hindi were also personally delivered to scientific and religious leaders in Tokyo and New Delhi.

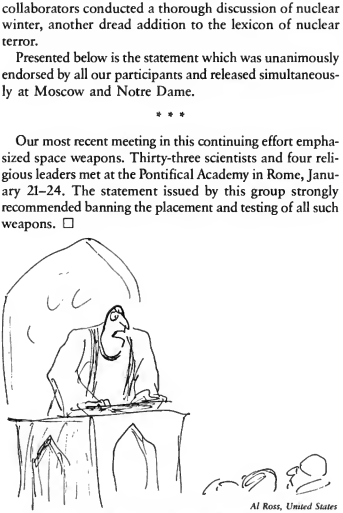
Tom Malone then organized a new type of meeting, of about 30 members, half scientists from the major nuclear powers (including China this time) and half religious leaders—Christian, Jewish, Muslim, and Buddhist. We met in November 1984 at the Villa Serbelloni in northern Italy, courtesy of the Rockefeller Foundation. The meeting was sponsored by the International Council of Scientific Unions and the University of Notre Dame's Academy of Peace at Tantur, Jerusalem.

The rapport among the five nuclear-power representatives, as among the religious and scientific leaders, was extraordinarily cordial and fruitful. This was the first meeting Velikhov missed, since he was on his way to London with Mikhail Gorbachev, but we did have a strong Soviet delegation with a religious member for the first time, Archbishop Kirill of Leningrad. Carl Sagan, Paul Crutzen, Rauld Sagdeyev, the director of the Soviet Space Agency, and their collaborators conducted a thorough discussion of nuclear winter, another dread addition to the lexicon of nuclear terror.

Presented below is the statement which was unanimously endorsed by all our participants and released simultaneously at Moscow and Notre Dame.

* * *

Our most recent meeting in this continuing effort emphasized space weapons. Thirty-three scientists and four religious leaders met at the Pontifical Academy in Rome, January 21–24. The statement issued by this group strongly recommended banning the placement and testing of all such weapons. □



Al Ross, United States

"And now, a few words about limited nuclear extinction."

Conference statement

THE THREAT of nuclear war and the hope for its prevention have become fundamental moral and political challenges to all of humanity. They cannot be dealt with primarily as problems for scientific and technical manipulation. The building of more nuclear weapons and the improvement of their technical sophistication are not the path to global security. There is no hope that a technical "breakthrough," such as weapons systems in space, will provide clear superiority or significant protection.

The world nuclear arsenal is already sufficient to destroy our global civilization. Substantial cuts in that arsenal could have powerful and desirable psychological and political effects.

In the search for effective means of escape from the threat of nuclear disaster, it is important to begin with the necessity for fundamental changes in international relations, especially in the relations between the Soviet Union and the United States.

Facing this reality is made more urgent by the continuation and acceleration of the nuclear arms race. In addition, recent scientific analyses strongly suggest that, apart from its other hideous and unmanageable consequences, a nuclear war could set in motion calamitous climatic and other environmental changes over large areas of the globe and attendant ecological disaster.

The whole world must be aroused, peoples and leaders, to a realization that the future of the human species and of the planet is imperiled by the threat of nuclear war and by the possibility that in some circumstances one of the results may be what has come to be called nuclear winter—cold and darkness around the world caused by the spread of smoke and dust. Constructive and mutually acceptable steps are urgently required to reverse the morally indefensible drift toward those disasters.

The immediate and long-term consequences of a nuclear exchange could bring such vast destruction upon the peoples of the world as to constitute an unprecedented, planet-wide catastrophe. Countries distant from the nuclear target areas could also face disaster. Much of the world would be threatened by crop failures, unparalleled famine, mass starvation, and widespread uncontrollable epidemics.

Nuclear war is a danger so horrible for all of humanity that we must renew and reinvigorate the search for generally acceptable solutions for reversing the arms race. Our central purpose and proximate endeavor must be to reduce international tensions (particularly between the Soviet Union and the United States), to develop more effective cooperative efforts for dealing with our common human problems and interests, and to bring a greater measure of justice and peace to the whole world.

This statement is made by an ad hoc group of scientists and religious leaders who have met over a period of five days at Bellagio, in northern Italy, to deliberate about these matters. We have gathered at the invitation of The International Council of Scientific Unions and the University of Notre Dame's Inter-Faith Academy of Peace. We come from a broad range of nations (including the five major nuclear powers: China, France, Great Britain, the Soviet Union, and the United States), major world religions, and a variety of scientific and professional disciplines. In our extraordinary diversity, we have found sources of stimulation, challenge, and broadening of vision of our several and shared responsibilities. We believe that those who approach these issues from positions rooted in these assorted disciplines, national loyalties, and belief systems have much to say to each other. We need to draw upon these many types of knowledge and skills. Science and religion can and must continue mutually to support the quest for a just and peaceful world. It is hard and necessary work to which we commit ourselves with conviction and hope. □

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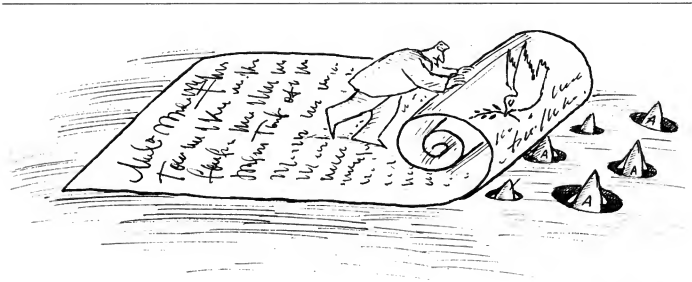

Paul Valerry, West Germany

Formal treaties and tacit agreements: an exchange

by Richard B. Bilder

IN HIS ARTICLE, "Contracts, Promises, and Arms Control," (*Bulletin*, October 1984), Russell Hardin argues that efforts to achieve formal and legally binding arms control treaties between the United States and the Soviet Union have inhibited progress in achieving arms control. He suggests that greater success could be achieved if the United States instead adopted policies of unilateral arms restraint or reduction which, if reciprocated by the Soviet Union, could result in informal and nonbinding arms control arrangements, or "contracts by convention."

This policy, if accepted by the Administration, could divert the United States from effective arms control efforts. We have no choice but to continue to pursue the admittedly difficult and frustrating task of trying to negotiate "hard" arms control agreements with the Soviets, and Hardin's suggestion that there is a simpler and easier path to effective arms control is illusory. Moreover, Hardin's arguments can be employed by others less sympathetic to the concept of arms control treaties as a reason for not attempting to reach binding arms control agreements with the Soviets. Arms Control and Disarmament Agency Director Kenneth Adelman's article in *Foreign Affairs*, "Arms Control With or Without Agreements" (Winter, 1984/5), makes similar arguments.

Certainly, all efforts to establish better cooperative relations with the Soviet Union are worth pursuing, and non-binding arrangements, such as parallel unilateral restraints, tacit understandings, or other types of informal bargains can often be very useful. When both nations are nervous about risking cooperation, tacit and nonbinding arrangements can at least provide a framework of reciprocal restraints, help to build mutual confidence, and establish a basis for further negotiation. Moreover, there are some situations in which simple and informal rules—typically, rules that each party *not* do certain things—are clearly in each country's interests and with which noncompliance is readily apparent; tacit reciprocity may be all that is needed to make the arrangement work. A tacit understanding not to test nuclear weapons in the atmosphere is an example. Finally, where comprehensive and legally binding agreements are not at the moment feasible—for example, where internal political or legal considerations preclude negotiating a formal treaty—informal arrangements reached through parallel unilateral action may be the best we can do.

As Hardin points out, we have had considerable success with certain tacit understandings, such as the 1963 nuclear test freeze, and with continued U.S. and Soviet reciprocal observance of lapsed or as yet unratified treaties such as SALT I, SALT II, or the Threshold Test Ban. We should explore the possibility of doing more along these lines. I would argue, however, that, contrary to Hardin's suggestions, the United States and the Soviet Union have been willing to observe the provisions of SALT I and SALT II only because the technical and legal details of these arrangements were fully spelled out and agreed to in the negotiations of these treaties.

I part company with Hardin's suggestion that such nonbinding arrangements are inherently preferable to formal agreements, or that they are more likely to lead to effective

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arms control. Nonbinding arrangements may be a good way of testing the waters and starting a negotiating process. But if we want long-term nuclear arms control assurance and stability, tacit and nonbinding agreements alone are unlikely to do the job.

Most cooperative arrangements are at best an imperfect balance between each party's desire for both flexibility—regarding its own obligations—and certainty—regarding the other party's compliance. Obviously, if arms control agreements are to be reached, compromise is necessary.

The broad, nonbinding arrangements Hardin suggests would certainly be easier for both the United States and the Soviet Union to agree to than would a formal treaty, in that tacit and nonbinding bargains give both sides maximum flexibility to pull out if they wish. However, since tacit bargains are neither detailed nor legally binding, they cannot provide the complex type of regulation that effective and acceptable arms control arrangements may require. Nor can they give either the United States or the Soviet Union the high degree of assurance of the other's prospective behavior and compliance that each has said it will demand before agreeing to limit nuclear or other weapons. Indeed, the Reagan Administration has frequently stated that it will under no circumstances agree to restrain weapons development and deployment unless the United States can be fully assured, through virtually foolproof verification, that the Soviet Union will strictly comply with reciprocal obligations to do likewise—a condition that the Administration is very skeptical can be met.

It is not clear, therefore, why tacit and nonbinding arms control agreements are likely to be more acceptable to the Reagan Administration than formal binding ones. How can we reasonably ask or expect the Soviets to comply with the SALT I, SALT II, or Threshold Test Ban Treaties, or have the right to accuse them of "cheating" on such agreements, unless we are willing to undertake a commitment to observe these treaties ourselves? Indeed, the president's February 1985 report to the Congress on "Soviet Noncompliance with Arms Control Agreements" demonstrates the problems and inherent awkwardness of the United States' accusing the Soviet Union of violations of nonbinding arms control understandings, such as SALT I or SALT II, on the basis of its alleged noncompliance with asserted "political" rather than legal commitments.

Moreover, it is not clear exactly what kinds of tacit bargains Hardin expects his approach to achieve. Does he really believe it likely that the Administration will be willing to unilaterally adopt a nuclear freeze, give up deployment of MX missiles, or decide not to proceed with its "Star Wars" initiative in the hope that the Soviet Union will voluntarily reciprocate? If the Administration is not even willing to talk to the Soviets about agreeing to do these things together, why should we expect it to be willing to do them alone? It seems unrealistic to expect either the United States or the Soviet Union to take unilateral action limiting armaments except where it believes that such a restraint serves its own national interests.

For the United States, tacit arms control bargains also raise questions of executive-branch accountability to Congress and the public, and, more generally, of U.S. constitutional law. Under the Constitution, the Senate must give its advice and consent before the president can ratify a treaty, and the Congress as a whole will usually share in any decision by the executive branch to commit the United States to other types of important international agreements. But the president may arguably establish and implement informal arms control understandings without seeking congressional approval. In view of the importance of obtaining broad congressional and public support for arms control arrangements, is it wise for the president to bypass normal constitutional agreement-making procedures?

FORMAL ARMS CONTROL treaties provide the requisite degree of predictability and assurance. Treaties spell out the rights, obligations, and procedures of complex mutual arms control arrangements in detail. They may include verification devices and other techniques to increase the likelihood of observance, provide procedures for resolving disputes, and mobilize a variety of international community pressures in support of compliance. Moreover, under U.S. law the process of approval of formal agreements involves not only the executive branch but also the Congress, and thus implicitly the public. If the agreement is approved, it is likely to reflect a national consensus and have considerable support and stability.

No experienced international lawyer would pretend that treaties can completely control the actions of powerful states. Treaties can be broken, and many factors combine to determine whether nations will in fact choose to live up to their agreements. Moreover, even the most carefully negotiated treaty cannot anticipate everything, and differences in interpretation and implementation will occur.

However, history demonstrates that formal contracts and treaties increase the likelihood that cooperative understandings will be observed and are often a sine qua non for individuals or nations to enter into such arrangements. Mutual benefit, continued cooperative relations, and a nation's good faith and reputation are very strong incentives for governments to keep their promises. That is why we—and the Soviet Union—take legally binding agreements so seriously, negotiate so hard, and agonize so long before committing ourselves to them—and why both we and the Soviets generally comply with formal and binding treaty obligations. As fragile and imperfect as treaties may be, they are our most useful tools for dealing with the peril of nuclear war. If the parties want a treaty to work, they will find ways to make it work—through consultation and mutual adjustments to meet the problems that will inevitably arise.

Hardin suggests that "we might be better off if we kept the lawyers out of it." But an overly "legalistic" approach is not what stands between us and controlling the nuclear arms race. The obstacles are much more substantive and intractable: apparent doubts as to the usefulness of arms control agreements by a number of influential U.S. and

Soviet military and civilian leaders; a desire for arms superiority; mutual distrust and concern that the other side may cheat and thus gain a crucial strategic advantage; fear of seeming to be too "soft" or of taking risks with national security; fear that the other side may "win" (or appear to domestic constituencies to have won) a negotiation; the relentless military pressure for more and better arms; the special and skillfully asserted economic interests of the armaments industries; excessive deference by both the government and the public to the assumed "expertise" of the nuclear strategy establishment; and a fascination with rapidly developing technology.

It would not be helpful to dispense with professional legal skills in making the kind of solid and binding agreements that we need. Sooner or later we will have to confront, not the lawyers, but the difficult underlying problems, both within our own society and in our relations with the Soviets. If we are to have any chance for survival, both the United States and the Soviet Union will have to work out a practical way of living in peace.

I agree with Hardin's suggestion that, if the United States and the Soviet Union are for the time being not getting anywhere in negotiating formal arms control agreements, we should try nonbinding tacit bargains and see if they can help. But I am against any position that suggests that tacit bargains are all we need try for or that they offer a stable and long-term solution to the nuclear arms race. The only realistic and effective way we have of trying to control the arms race is through negotiating solid and legally binding international agreements with the Soviets—agreements that both parties consider as fair and as protecting the vital interests of both. □

A rejoinder

by Russell Hardin

RICHARD BILDER'S reply is a welcome entry into the debate on how best to revive and pursue arms control efforts. Not surprisingly, as an international lawyer, Bilder strongly advocates dependence on "hard" treaties. Since no one in the field is likely to dispute the claim that good arms control treaties are eminently to be desired, the issue is clearly not whether treaties are good or useful but whether our arms control efforts should focus almost exclusively on negotiating treaties.

As I argued, treaties are best at ratifying the status quo in particular areas (as the Limited Test Ban Treaty ratified the unilateral, reciprocal cessation of atmospheric testing) and at putting ceilings on extant trends (as SALT I put ceilings on the number of land-based ICBMs). They are worst at actual disarmament and at cutting off new lines of development. Indeed, many new developments, such as the MIRV-

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ing of missiles, have been stimulated by treaties that blocked other avenues of arms expansion. Unfortunately, Bilder does not debate such specific claims.

The shortcomings of tacit agreements and of treaties are generally different. Insistence on treaties often limits what can be achieved in nuclear arms control. Tacit devices are less precise and perhaps less secure. In international law, however, where there is no higher authority to enforce formal agreements, treaties are at most marginally more secure than tacit agreements—both are backed by the capacity and will of the other side, not of a higher authority, to impose sanctions for violations. Bilder focuses on the greater precision and possibly greater certainty of compliance under treaties and concludes that they are the "only" device we have. He does not address my central argument that restriction of our efforts to seeking treaties places severe practical limits on what we can expect to achieve. Those who support arms control by reciprocated moves outside the framework of arduous treaty negotiations do not oppose precision or enforceability. But no one, certainly no international lawyer, should be deceived into supposing that treaties bring much enforceability, and everyone must have learned by now that precise language in many arms control treaties is precision about the past while the present and future are wide open and ill-defined.

No one should be deceived into supposing that treaties bring much enforceability, and everyone must have learned that precise language in arms control treaties is precision about the past while the present and future are ill-defined.

Bilder suggests that the Reagan Administration is especially unlikely to attempt tacit, unilateral moves in the hope of their being reciprocated. However, Reagan's most striking feature has been his flair for leadership. If he has any commitment to arms control, he will best achieve serious changes by making the first move. While negotiations in Geneva cannot force him to move on arms control, they can surely slow him down. And they are unlikely to result in any significant success during his tenure. If he has no commitment to arms control, the Geneva negotiations may be either helpful or detrimental in the long run: helpful if negotiations are kept to serious technical matters to lay the ground for future efforts, and detrimental if they are used for political posturing that would make future efforts harder. I would counter Bilder's contention that the Reagan Administration would never attempt unilateral, reciprocal moves toward arms reductions, by suggesting that the president will either attempt such moves or accomplish nothing. Let us therefore encourage him to use his best political talents and not to relegate arms control to Geneva.

I concur with Bilder that it would not "be helpful to dispense with professional legal skills in making the kind of solid and binding agreements that we need." Indeed, I would go further and suggest that such skills should be brought into our domestic debate as well as into the treaty process. As a lawyer, Bilder should hold us all to exacting standards of care and precision in stating our own and interpreting others' positions. In his present response, perhaps he has been distracted from such care by that other great legal skill, forensic debate, the point of which is to win, not to reach agreement.

Bilder says that I seem to suggest that "tacit bargains are all we need try for." On the contrary, I took care to argue that tacit agreements are "not a panacea" and to explain why "there are some cases in which we should rely on informal devices, while in others we should seek formal treaties." In this forum and on this issue, trial-lawyer forensics should be avoided. Adversarial devices not only distort our discussions, ironically they also distort lawyerly negotiation of arms control treaties, which cannot be won but can only be agreed to.

I hope that we may soon see reciprocated unilateral moves toward arms reduction followed by treaties to ratify our successes and to create better institutional safeguards against backsliding. I doubt that Richard Bilder and I have any disagreement on this hope. The United States is now in an excessively adversarial relationship with the Soviet Union, rather like that of early 1963, when treaty negotiations were likewise getting us nowhere. An unusual moment of leadership got us out of that impasse, into the Limited Test Ban Treaty, and on into a decade of successful treaty negotiations and—what is even harder to imagine today—ratifications.

I agree that we want hard treaties and real arms control. But 40 years of the nuclear era have taught us that nuclear arms control treaties:

- have been resolutely accompanied by steady escalation in armaments;
- have not resulted in disarmament;
- often put performance to the letter above keeping to the spirit of their provisions;
- face horrendous obstacles from opportunistic domestic politics in the United States;
- commonly stimulate buildup by both sides to have something to negotiate away as "bargaining chips";
- can seldom be negotiated and ratified by a single administration in the United States (unless they follow successful tacit accommodation, as in the case of the Limited Test Ban Treaty); and
- often inhibit decisive leadership while arms programs virtually beckon such leadership.

In sum, treaties are misfit for arms reduction and blocking certain innovative developments. Because these are precisely the goals we should put at the fore right now, we should do more than focus narrowly on treaty negotiations. Single-minded striving to achieve the best possible treaties has not produced good arms control. □

Survival Is Not Enough:
Soviet Realities and America's Future
by Richard Pipes
Simon and Schuster
302 pages; $16.95

reviewed by Coit D. Blacker

In *Survival Is Not Enough,* historian Richard Pipes abandons his usual scholarly focus on the political and social bases of tsardom in the nineteenth century to offer us his analysis of the modern Soviet system and its relations with the outside world. Pipes concentrates, in particular, on what he regards as the ability of Soviet leaders, ruling in effect by decree and without democratic constraints, to conduct a coherent, consistent, and purposeful foreign policy while Western governments, rent by sudden shifts in public opinion, oscillate wildly between truculence and accommodation in their dealings with the Soviet Union. Needless to say, Pipes finds this situation dangerous.

To protect Western interests, curb Soviet expansionism, and deter nuclear war, Pipes proposes a U.S. foreign policy that would combine adequate military strength with a form of economic and political warfare against the Soviet regime. Only through such a policy, he argues, can the Soviet system be reformed, a necessary precondition for a change in the country's foreign policy goals. "The key to peace," Pipes writes, "lies in an internal transformation of the Soviet system in the direction of economic decentralization, greater scope for contractual work and free enterprise, national self-determination, human rights, and legality."

In short, Pipes urges U.S. policymakers to formulate and then implement a strategy that would encourage nothing less than a revolutionary transformation of the Soviet state. Consistent with this vision, he dismisses the policy preferences of U.S. "hawks" and "doves" with equal dispatch, criticizing the former for being "overly obsessed with the strictly military aspects of the relationship," and the latter for their belief in the utility of "friendly gestures" as a mechanism to reduce superpower tensions.

Pipes is self-consciously aware that the course he advocates would constitute an abrupt break with existing U.S. policy toward the Soviet Union. What we require, he argues, is not a mere refinement of existing U.S. diplomacy, but a new strategic design. Without an articulated "grand strategy" to provide coherence and direction, Pipes suggests, policy loses its substantive content.

To be convincing in his advocacy, Pipes must demonstrate the abject failure of post-war U.S. policy toward the Soviet Union and the incompetence of its practitioners. This he seeks to do by correcting the historical record and by drawing on his considerable stature as a scholar of Russian affairs to interpret Soviet actions and policies. His effort falls short on both counts.

Pipes contends that throughout much of the Cold War, the U.S. intelligence community consistently underestimated the development of Soviet military capabilities. In fact, during the late 1950s and early 1960s, the United States routinely overestimated the likely growth in Soviet strategic forces. Given the importance Pipes attaches to this point, one would have assumed a more careful and balanced reading of the record on his part.

He goes on to argue that such "misinterpretations" were responsible for the "absence of a vigorous United States response to the Soviet nuclear programs of the 1970s." Beyond the failure to establish causality, Pipes overlooks the fact that between 1970 and 1975 the number of U.S. nuclear warheads deployed on intercontinental-range and submarine-launched ballistic missiles increased by a factor of four. The accuracy of those systems, a critical index of their effectiveness against military targets, improved dramatically as well.

Selective readings of history notwithstanding, Pipes makes perhaps his most serious errors when discussing Soviet views of nuclear weapons and nuclear war. At one point he urges anyone interested in these issues to "familiarize himself with Soviet nuclear doctrine and programs." He would have been well advised to take his own advice. The Soviets, Pipes asserts, state that any U.S. use of nuclear weapons against the Soviet Union or its allies will inevitably unleash a nuclear holocaust. Soviet officials do not make such statements and have not done so since the mid-1960s.

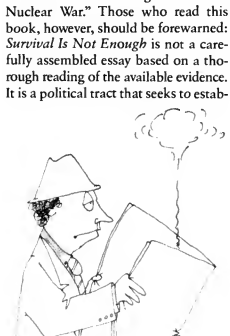
In arguing that the Soviet military believes it possible to win a strategic nuclear war with the United States, Pipes relies on a single Soviet source from 1969. He ignores those Soviet military and political writings, equally authoritative, from the mid- and late-1970s which call into question the very notion of "victory" in the event of a strategic nuclear exchange. Moreover, he misses perhaps the central issue for today's Soviet military planners, which is how to forestall the early use of nuclear weapons by the West in order to exploit Soviet conventional military advantage in the various "theaters of military operations."

Ultimately, however, it is Pipes's inability to persuade us that a new U.S. strategy will produce the results he foresees—rather than his treatment of the historical record and his characterization of Soviet military doctrine—that eviscerates his analysis. He asserts, for example, that political and economic pressure on the Soviet regime, consistently

applied, will compel the leadership to undertake democratizing reforms or face the prospect of domestic upheaval. "Were Lenin alive today," he writes, "he would very likely conclude that the conditions in his country and in its empire meet the criteria which he had established for 'revolutionary situations.'"

There is nothing to suggest that the Soviet Union today is in any sense a candidate for popular revolution. It is and seems destined to remain one of the world's most stable countries. Nor is there any reason to suspect that the *nomenklatura* (ruling elite) would react to economic adversity by sharing power with its people. On the contrary, the combination of a U.S.-led anti-Soviet crusade and physical privation would almost certainly intensify the Kremlin's sense of encirclement and result in more rather than less government repression.

Despite its failure to persuade, *Survival Is Not Enough* is an important book that is destined to be celebrated and widely cited, given the stature of its author and the crispness of the writing. It is likely to become as influential and controversial as the author's 1977 essay in *Commentary,* "Why the Soviet Union Thinks It Can Fight and Win a Nuclear War." Those who read this book, however, should be forewarned: *Survival Is Not Enough* is not a carefully assembled essay based on a thorough reading of the available evidence. It is a political tract that seeks to establish its authority by the use—or in this case, misuse—of scholarly methods. □



Richard Cline, United States

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Nomenklatura: The Soviet Ruling Class, An Insider's Report
by Michael Voslensky
translated by Eric Mosbacher
Doubleday
472 pages; $19.95

reviewed by Richard Longworth

Any diplomat or journalist who has spent time in the Soviet Union and whose job involves getting accurate information on that vast and secretive land quickly realizes that there are two kinds of Soviet citizens: a tiny inner circle of officials and administrators who know everything that goes on, and the rest of the population, who know literally nothing beyond the scope of their own lives. The latter often includes executives, academics, even Communist Party members; clearly, some extra status is necessary to enter the charmed circle, whose members all seem to know each other and live in a self-contained world that positively throbs with power.

This is the *nomenklatura,* or "Soviet ruling class," as described in this useful, if tendentious, book by Michael Voslensky, a historian and former Soviet professor and academic politician (although apparently not a member of the inner circle himself). Voslensky left the Soviet Union in 1977 and now is the director of the Institute of Contemporary Soviet Research in Munich.

The author builds on the work of the late Merle Fainsod, whose *How Russia Is Ruled* remains the definitive work on the structure of Soviet institutions, and *The New Class,* by Milovan Djilas. Fainsod, an American, wrote as a careful academic; Djilas, a rebel from the Yugoslav leadership, wrote as a knowledgeable outsider. Voslensky, an outraged and scornful Russian, is as close to a Soviet insider as a non-nomenklaturist could be. He is less interested in formal structure than in the people who hold true power, their values and methods, how they work, and the benefits they reap. He is no dispassionate observer: his chapters carry such headings as "Exploiting Class," "Privileged Class," and "Parasitic Class." He occasionally gives the devil his due, recognizing the growth of heavy industry under the Soviets or the raising of living standards in Soviet Central Asia, but these are scant parentheses of polemic that detract from the book's real interest.

That interest derives from his important insights into the men (no women appear in these pages) who run the world's other superpower. These men make up the nomenklatura, so called because it is the name of the list of the highest-ranking jobs in the Soviet Union: the persons who hold these jobs must be examined and confirmed by the Communist Party and can only be fired by the Party. In practice, these are the leaders of the Party itself, trade union leaders, cabinet ministers and their deputies, party and government leaders in the Soviet republics and major cities, judges and prosecutors, the KGB, military leaders, ambassadors, heads of universities and academic institutes, industrial executives, leaders of collective and state farms, even the Russian Orthodox Patriarch of Moscow and All Russia. Voslensky estimates that there are 750,000 nomenklaturists altogether, or one out of every 350 Soviet citizens; by contrast, the Communist Party, with 17 million members, is much less selective.

Voslensky calls the nomenklatura a separate class, the ruling class of the Soviet Union, existing apart from and above the two "official" classes of workers and peasants. In his analysis, it meets all the Marxist criteria for a class, being self-contained, largely hereditary, with a distinct social and economic status, and a clear idea of its own class interest. There is no room in Marxist-Leninist ideology for such a class, but Voslensky asserts that the nomenklatura arose directly from Lenin's theory of revolution.

The Bolshevik revolution of 1917 was not led by the working class but by "the vanguard of the working class"—that is, a small and dedicated band of professional revolutionaries, mostly intellectuals, led by Lenin. After the revolution, Lenin turned to them to administer the Soviet state. Being relatively few in number, they were quickly supplemented by careerists. Although these revolutionaries ruled in the name of the workers and peasants, there were relatively few workers or peasants among them. It was, as Voslensky says, not a "dictatorship *of* the proletariat" but a "dictatorship *over* the proletariat."

The nomenklatura became institutionalized as a separate class, without links to the revolutionary past, in the 1930s purge trials that destroyed the Leninist old guard. But the nomenklatura lost control of the purges, and thousands of nomenklaturists were murdered by the secret police. The reforms that followed Stalin's death were aimed at restoring the nomenklatura's control over the KGB: as Voslensky notes, "Khrushchev's secret report [in 1956] is concerned only with Stalinist repression of the nomenklatura, [not with] the fate of millions of ordinary citizens liquidated under Stalin."

This, Voslensky says, left a professional nomenklatura with "two essential functions—administration and the exercise of power." Unlike the ruling classes of capitalist countries, the Soviet nomenklaturists are "controllers, not owners . . . what matters is not property but power." If a Western mogul gets power from wealth, a Soviet nomenklaturist gets wealth from power. As a capitalist sees the making of money as an end in itself, so the nomenklaturist views the amassing of power.

The nomenklatura does not actually own Soviet industry but controls it as though it did. Since it thus controls a monopoly, it has no need to make a profit or satisfy consumer demands and so, Voslensky says, is free to pursue its "fundamental economic law"—that is, it "endeavors by economic means to assure the security and maximum extension of its own power." The planning and quota systems of Soviet production are geared to this end since they make it easy for managers to fulfill directives and, hence, to secure their own positions. Quality is difficult, but quantity is simple and rewarding, if not for consumers, then for producers, planners, and party officials. This, he says, is why the Soviet economic system rolls on unreformed in the face of massive evidence that it does not work: "it rests on an extremely solid foundation, the common interests of everyone concerned . . . what counts is not the actual results, but reports of successes that will bring increases in salary and other benefits."

Even the armaments industry is run in the same way, since it cannot be separated from the rest of society, Voslensky says. To Western strategists alarmed by the sheer numbers of Soviet arms, this is a useful warning not to confuse quantity with quality: Soviet missiles, like Soviet toasters, have a high failure rate.

The power of the nomenklatura is such, Voslensky says, that it governs the country as a sort of permanent civil service, able to swallow or overrule the orders of the nominal leaders, no matter how powerful. "If policy was autocratically laid down by personalities as different as Stalin, Khrushchev, Brezhnev and Andropov," he asks rhetorically, "how did it come about that the most significant features of that policy remained unchanged?"

Much of what Voslensky has to say about the nomenklatura's lifestyle—the special shops, hospitals, schools, city houses, dachas, cars, travel—will not be new to Western readers. While nomenklatura salaries are relatively modest, the perks and bonuses and bribes add up to an income many times that of ordinary Soviet citizens. In this, they resemble the relatively wealthy, isolated foreign residents of Moscow; in fact, Voslensky calls them "a class of persons that actually live like foreigners in their own country."

To a great degree, the nomenklatura class, like any other ruling class, has become hereditary. Fathers open doors for sons, and entrance into the best schools requires such heavy bribes that only the wealthy, that is, the nomenklatura, can afford them.

So far, much of what Voslensky has had to say agrees with observable evidence or offers plausible explanations for the mysteries of Soviet life. He is on soggier ground in his claim that the nomenklatura, having achieved unchallenged power in the Soviet Union, seeks to expand that power to "world hegemony." It is perfectly ready and willing to attack and conquer the West, he says, but is deterred only by Western firmness. This, he says, is "the constantly pursued, deliberate aim of the Soviet ruling class."

In fact, as the rest of the book makes clear, the aim of that class is its own security and power; foreign adventures would at best diffuse that power and at worst risk it. This contradiction is papered over with the phrase that "there really is no reason to doubt the nomenklatura's often repeated statements of its intent to establish real socialism throughout the world." Actually, Voslensky spends the rest of the book demonstrating, with some success, that most of the nomenklatura's other statements—on its devotion to the working class, for in-

stance—are so much window-dressing.

Anyone familiar with the disinformation policies of the CIA and KGB has to be wary of such insistence on the Soviet lust for world conquest. This is no doubt unkind and unfair to Voslensky; most of his book has the ring of accuracy, and Soviet emigres traditionally impute the worst possible motives to the government they left behind. Yet, in the end the book degenerates into a Cold War sermon, and it becomes tiresome long before it ends. A pity: three-fourths of it belongs on any shelf of required reading about the Soviet Union. □

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Keeping America Un-Informed: Government Secrecy in the 1980s
by Donna A. Demac
Pilgrim Press
180 pages; $8.95, paper

reviewed by Gerald Marsh

The secrecy initiatives of the Reagan Administration would seem to be directed at helping us achieve the state of knowledge reflected in this Zen quatrain: "Those who speak, do not know. Those who know, do not speak." This, however, represents neither an understanding of Zen nor of the best security interests of the United States. As Justice Potter Stewart wrote in the Pentagon Papers decision, "When everything is classified, then nothing is classified, and the system becomes one to be disregarded by the cynical or the careless and to be manipulated by those intent on self-protection and self-promotion. . . . The hallmark of a truly effective internal security system would be the maximum possible disclosure, recognizing that secrecy can best be preserved only when credibility is truly maintained."

Of particular concern is the growing public acceptance of the contention that technical information is not protected by the First Amendment. This idea first surfaced in 1979, when the government tried to prevent the *Progressive* from publishing an article about hydrogen bombs. Technical data, the incredible argument went, are "not an essential part of any exposition of ideas, [nor of any] social value as a step to truth." Despite this and other abuses of secrecy under his Administration, President Jimmy Carter's 1978 Executive Order on National Security Information aimed at "increased openness in Government by limiting classification and accelerating declassification." Information was to be declassified if the need for secrecy is "outweighed by the public interest in disclosure of the information."

The Reagan secrecy initiatives completely reverse the Carter trend toward openness. They threaten to erode the principle of accountability that lies at the very heart of our Constitution. The Administration's avowed purpose of impeding technology transfer to hostile countries and protecting "national security" is inadequate justification.

Keeping America Un-Informed is a comprehensive and highly readable study of government secrecy under the Reagan Administration. It examines not only classified information, but also the gathering and publication of data by various federal agencies. The work is unusual in its breadth, serving to bring out the full scope of what Demac calls "the mosaic of government secrecy."

One of the most important contributions of the book is its discussion of the role played by the Office of Management and Budget: "During the 1980's, the OMB assumed a position rivaling that of the three traditional branches of government. Taken together, its budgetary and regulatory functions raised fundamental constitutional issues regarding centralization of political power." The OMB can no longer be thought of as having the limited role of budgetary accountant, but must be seen as a manager of information.

The principal deficiency of *Keeping America Un-Informed* is the lack of an appendix containing excerpts from relevant presidential directives and other key documents. Such an appendix could easily have been substituted for chapter 11, "Prying Open the Lid: Directory of Public Organizations," a call to arms that is somewhat out of place. The book is otherwise well documented and contains an extensive bibliography and set of notes.

Keeping America Un-Informed is a significant contribution to the public debate on government secrecy. It emphasizes that the Western democracies derive much of their basic strength from openness and citizen participation in the political process. Excessive secrecy erodes that strength.

Technology is growing in scope, pervasiveness, and complexity. If there is to be informed public debate on the broad spectrum of scientific and technological issues facing modern society, technical information of sufficient depth and detail must be available to the citizenry. □

Gerald Marsh, a physicist with the IIT Research Institute in Chicago, is the coauthor of Born Secret: The H-Bomb, the Progressive Case and National Security *(1981).*

The Imperative of Responsibility: In Search of an Ethics for the Technological Age
by Hans Jonas
University of Chicago Press
267 pages; $23.00

reviewed by James M. Gustafson

For decades, Hans Jonas, the Alvin Johnson Professor of Philosophy Emeritus at the New School for Social Research, has been influential among a relatively small portion of the American intellectual community. His philosophical interests have been in a range and depth of issues bypassed or skirted over by dominant movements on the philosophical scene. He thinks in organic terms, and so he can begin with observations about plants and their environments and move to a macrocosmic view. The distinctiveness of the human, however, is never outside the scope of his attention. While he eschews the appellation "theologian," he has been of great interest to some religious thinkers.

His interest in practical moral questions antedates the interest other American moral philosophers have shown in them in recent years. For example, his essay on human experimentation—in the first issue of *Daedalus* on that subject in 1969—has been followed by literally volumes on the subject; yet many return to it not simply for moral argument but for moral wisdom.

This current book is one of both prophetic challenge and ethical theory; few in philosophy or theology manage to hold these strands together. By prophecy I mean an interpretation of current circumstances which calls attention to dangers to well-being in a quite dramatic way. On its critical side, prophecy is, as Jonas himself says, a "heuristics of fear." It stimulates affectivity, as well as rationality, and communicates a sense of urgency about matters at hand.

As a book of ethical theory, it centers on the idea of responsibility, which, for most moral philosophy in North America, has been confined to accountability for particular acts, similar to its use in tort law. This aspect is, of course, profoundly strong in Jonas, but his theory also includes dimensions of wider analysis. Indeed, the book's main factual premise is that modern science and technology have created radical new possibilities of intervention into many areas of life because of the interrelationships between the consequences of human choice and intervention and the network of life in the world.

Whether finally correct or not, a premise is that "the boundary between 'city' and 'nature' has been obliterated." "The difference between the artificial and the natural has vanished, the natural is swallowed up in the sphere of the artificial, and at the same time the total artifact . . . generates a 'nature' of its own, that is, a necessity with which human freedom has to cope in an entirely new sense." He argues that only an ethics of responsibility such as he develops is adequate to this new situation. Chapters two through four develop the ethical theory philosophically, with explicit and implicit references to many issues in historical and contemporary philosophical ethics—for example, the "is-ought" relationship. These chapters will be of great interest to the philosophical readers of the *Bulletin* and are worthy of serious study; other readers might find them to be abstract and of less interest.

Jonas states the imperative that the theory backs in several forms:

- positively, "Act so that the effects of your action are compatible with the permanence of genuine human life";
- negatively, "Act so that the effects of your action are not destructive of the future possibility of such a life"; or
- "Do not compromise the conditions for an indefinite continuation of humanity on earth."

The values implied in these forms of the imperative are, for Jonas, threatened by deep cultural tendencies. Given the interconnectedness of things in the world, and given an orientation toward the long-range future in Jonas's depiction of the effects of action, the points to be considered in the development of ethics are extended in both their (in my terms) spatial and temporal dimensions.

The prophetic interpretation of our circumstances grounds the urgency of a different view of ethics, though I believe that the arguments for the ethical theory of responsibility could stand independently of the prophetic. Chapters five and six, however, interweave them nicely. Here Jonas moves from such heady ideas as the requirement that we say "no to Not-Being" and "yes to Being" to critiques of all forms of utopianism. This section involves an extensive and distinctive critique of Marxism and other ideas of progress. Because Jonas paints on a large canvas with broad strokes, we do not see how he would apply his ethical theory to specific policy issues. This is a major disappointment.

Bulletin readers might expect that in the light of his analysis and imperatives the presence of nuclear weapons in the world would be the primary object of his concern. He is sure that those who concentrate "the apocalyptic potential of our technology" on the bomb do not exaggerate the peril.

> But it has one consolation: it lies in the realm of arbitrary choice. Certain acts of certain actors can bring about the catastrophe—but they can also remain undone. Nuclear weapons can even be abolished without this requiring all of modern existence to change. (The prospect is admittedly small.) Anyway, decisions can still play a role—and in these fear. Not that this can be trusted; but we *can* in principle, be *lucky* because the use is not *necessary* in principle, that is, not impelled by the production of the thing as such (which aims at obviating the necessity of its use).

Jonas says that his main fear is rather "the apocalypse threatening from the nature of the unintended dynamics of technical civilization as such, inherent in its structure, whereto it drifts willynilly and with exponential acceleration: the apocalypse of the 'too much,' with exhaustion, pollution, desolation of the planet. . . . With all respect for the threat of sudden destruction by the atom bomb, I put the threat of the slow incremental opposite, overpopulation and all the other 'too much' in the forefront of my fears." Here he has perhaps exaggerated the way in which rational choice will be effective in issues of war and underestimated the way in which nuclear weapons are themselves part of the political dynamics of technical civilization.

The book concludes with Jonas's defense against charges of antitechnologism and antiscience. It is the present intoxication with technology that creates his fears.

There is, interestingly, little reference to other current literature dealing with his basic issues in both similar and different ways. What we have is a learned and wise philosopher's prophetic spirit joined with sophisticated rationality—a rare combination in American intellectual life. Where one is not persuaded by him, one is forced to adduce evidences and develop arguments to support a different view. □

James M. Gustafson is a professor of theological ethics in the Divinity School and the Committee on Social Thought at the University of Chicago. He is the author of the two-volume Ethics from a Theocentric Perspective *(1981, 1984).*

Sakharov's plight

I should like to second the letter from Theodore H. von Laue (*Bulletin*, January 1985). Von Laue is a distinguished historian and the son of an eminent German physicist. He is in a unique position to assess the politics of physics and the plight of the physicist who makes his career in weapons research.

Sakharov's fate should be compared with Oppenheimer's and Teller's in the United States. Attempts were made to discredit Oppenheimer, and his security clearance was revoked. Teller—the prototypical scientific hawk, on the other hand—has thrived. Sakharov has fared less well than Oppenheimer. But he has not been jailed or sent to Siberia.

Perhaps the force of world opinion protects Sakharov. It would seem most embarrassing to the Soviets were he to disappear mysteriously. Thus, I think, expressions of genuine concern among scientists throughout the world for Sakharov's personal welfare can help him.

But, as von Laue convincingly points out, it will not help Sakharov if we make him a pawn in the Cold War. American scientists who beat the drum for Sakharov should ask themselves whether they seek the welfare of the man, or whether they are using him in asserting their own self-righteous anti-communism, or whether (in some cases) they are consciously implementing U.S. Cold War propaganda.

Carl Barus
Swarthmore College
Swarthmore, Pennsylvania

* * *

I would like to say a few words concerning the issue of American scientists' reactions to the plight of Andrei Sakharov, which was discussed in the editorial of the August-September 1984 *Bulletin*. I take my hint from the editors' recommendation that "patience, not silence" is needed. I will be patient with the subsequent remarks of Carl Blumenstein in the November issue and Theodore von Laue in the January issue, but I cannot remain silent.

Sakharov was subjected to continuous harassment and placed in internal exile in clear violation of the laws of the Soviet Union. He is a symbol to us because of his determined efforts on behalf of people whose rights are being violated the world over. He was instrumental in convincing the Soviet authorities to agree to ban atmospheric nuclear tests, and he was outspoken in his belief that greater communication is needed between the superpowers. He has not violated the law, and he wants nothing more for himself than to be left alone by the authorities.

Efforts by us on his behalf may fail, but they certainly cannot hurt. To believe that a break between scientific academies contributes to the "mobilization for a nuclear confrontation," in von Laue's words, is naive. Official relations between academies can be broken and reinstated at will; they do not influence the mechanics of the arms race. Dialogue is certainly needed, but we should try to show that we believe in what we are saying. Sakharov has lighted the imaginations of many people in many nations who hope for peace and a better life. "Let his American well-wishers therefore take him out of the limelight of moral indignation," von Laue tells us. We could not do so if we tried.

Blumenstein asserts that we are being "led by the State Department, which has turned the issue into one of human rights." But human rights has always been the issue, whether or not we have seen it as such. To pretend concern about the great issues of the world while turning our backs on our individual rights only illustrates bad logic. German science under Hitler was not inhuman because it was brainwashed into hating the Soviets, as Blumenstein believes, but because it often ignored what was happening in its own land to many of its own people. If human rights had been a greater issue as the abuses began, perhaps history would have followed a different course. "Why are human rights secondary in superpower struggles?" Why, indeed? Blumenstein goes on to imagine that if Sakharov were free he might build the bomb for Israel, and that the Soviet authorities may have done us all a favor by putting him away. I never thought that I would find such absurd speculation in the pages of the *Bulletin*.

We should live free from threat, whether of war or of arbitrary authority. We should fight on both fronts. To argue that the battle for human rights should be postponed in favor of the battle for arms reduction only creates confusion and defeat on both fronts, because they are essentially the same struggle.

Gary Pereira
Princeton University
Princeton, New Jersey

Star Wars not viable

It is always shocking to observe how quickly the lessons of the past are forgotten by zealots and ideologues the world over. It was only about 30 years ago that Nikita Khrushchev announced that his scientists had developed the ability to "hit a fly in space" and that, as a consequence, the Soviet Union was about to deploy an anti-ballistic-missile (ABM) system that would henceforth protect it from the threat of a nuclear attack from any capitalistic aggressor.

Our first response was to launch a major ABM effort of our own. But we soon realized that, while it might be possible to hit a single fly in space, the problem was very different if there were 1,000 flies attacking at the same time—or perhaps a few thousand fly-like objects of which only a few hundred were real, and the rest indistinguishable decoys—while there were only a limited number of ABMs available. In short, any defensive system could be saturated by the offensive system at a cost considerably less than that of the defense.

This realization led to the negotiation of the ABM Treaty of 1972—perhaps the most effective and stabilizing of the post-World War II arms control measures.

At the same time, however, we went ahead (and the Soviets soon followed) with the development of decoy systems, then of multiple reentry vehicles (MRVs) and, finally, multiple independently targetable reentry vehicles (MIRVs). Thus, through the convoluted "logic" of strategic technology and doctrine, despite the elimination of ABMs, we precipitated a race in offensive technology which has led, inevitably, to the current concerns about the adequacy of our deterrent capabilities.

Now, once again, visions of space-based offensive and defensive "sugar plums"—laser and particle beams and similar "Buck Rogers" schemes—are exciting some members of the military-industrial-academic-political complex to indulge in technological pipe-dreams, so well illustrated by the article "Defense in Space is not 'Star Wars'" by Zbigniew Brzezinski, Robert Jastrow, and Max Kampelman, published in the January 27 *New York Times Magazine.*

The fact remains that space-based systems, both defensive and offensive, have two fatal flaws:

- Both sides can and, given the nature of the U.S.-Soviet competition, inevitably will play the same game. What we deploy, they eventually will, and vice versa.
- Space remains the most open of all the media. Whatever we put up, they can see, examine, and emulate—and again vice versa. Furthermore, in a time of crisis, such systems are extraordinarily vulnerable. It only takes a small rock, dispatched by a very small rocket, to punch a hole in the fuel tank of a laser system and render it inoperable.

Star Wars—by any name one prefers to call it—is a dangerous and futile illusion. The sooner this fact is universally recognized, and the technically advanced nations tailor their activities to this truism, the sooner we can get to the real imperative of installing Eisenhower's "open space" regime, to the betterment of all humankind.

Bernard T. Feld
Massachusetts Institute of Technology
Cambridge, Massachusetts

Nonproliferation debate

Leonard Spector's assertion (*Bulletin*, January 1985) that "a Pakistani nuclear capability would mean that the nonproliferation regime had proven impotent" reflects a common and dangerous confusion between the two existing "regimes" for nonproliferation.

The nonproliferation regime associated with the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) cannot be accused, let alone rendered impotent by the actions of any nonparty, although it can be seriously compromised by the reactions of states party to it. The original purpose of that Treaty was to prevent the spread of nuclear weapons to those countries which even in the mid-1960s were moving rapidly toward the capability of nuclear weapons production—among them West Germany, Japan, and Sweden. That none of these countries at that time was actively seeking a nuclear capability is not the point. The NPT regime has succeeded magnificently in reinforcing and legitimating the intent of over 100 countries not to seek nuclear weapons, and in providing mutual reinforcement and reassurance among that group.

The other regime is a less formal one, addressed to that small group of countries who are not party to the NPT (or the Tlatelolco Treaty). It is sometimes argued that this group contains almost every country about which there is current concern: India, Pakistan, South

Africa, Israel, Argentina, and Brazil. But that is almost a matter of definition. The NPT regime cannot force countries to eschew nuclear weapons; its primary purpose is to reinforce a prior decision to do so. The countries on the short list of present concern have failed to conclude formal nonproliferation agreements for a variety of reasons, ranging from complaints about the discrimination inherent in the NPT division of nuclear weapons states from non-nuclear-weapons states to a security-driven desire to maintain at least the potential for going nuclear. Restraining proliferation among this group of countries requires different tactics—such as nuclear supplier guidelines or attempts to exert bilateral leverage—and should be judged by different goals and standards of behavior.

The NPT regime is indeed seriously threatened by the possibility that the September 1985 NPT review will replicate the failure of the 1980 conference to come to any agreed-upon final statement, or to resolve the tensions over the continuing nuclear arms race. It is therefore most regrettable that there has been no visible sign from the Reagan Administration of a coherent and responsible strategy to respond to these manifest and oft-repeated complaints. It is certain that the United States and the Soviet Union will attempt to point to the Shultz-Gromyko talks of January 1985 as evidence that good-faith negotiations to end the arms race have indeed resumed, but it is not clear how that promise to talk at some future date will weigh against such empirical data as the new deployment of nuclear-armed cruise missiles, SS-20s, and Pershing IIs.

A number of other points raised by Spector do fall into the purview of the formalized NPT/Tlatelolco regime, most notably continuing attempts to bring China and France into the NPT and Argentina and Brazil at least into the Tlatelolco regime. But these issues must be separated from efforts addressed at South Africa and Israel (who share a partial "pariah" status within the NPT regime), India (whose assertion that its 1974 test was not weapons-related needs to be encouraged for the sake of the NPT regime, however illogical that seems), and the very special case of Pakistan.

Thomas Cheney, United States

A Pakistani nuclear device would indeed be a serious blow to efforts aimed at containing proliferation among those countries not party to the NPT, as well as raising other fears about the response of India and possibly even the transfer of a weapon to Libya. In those terms it would be a clear and major policy failure for the United States as well as a serious threat to world peace and security. But it would *not* represent a similar defeat or failure for the NPT/Tlatelolco regime, to which the case of Pakistan is wholly external.

This distinction is neither trivial nor scholastic, but has real policy content. Any international regime—even the NPT regime, which is far more formal and restrictive than most—depends largely on the establishment of and belief in common norms and rules for compliance. In a sense, the regime continues to function only as long as its members believe in it. To declare the regime a failure because not all states would join, or because some nonjoiner violates its rules and intent, is to give up its real accomplishments to no purpose.

The NPT is perhaps the single greatest accomplishment of 30 years of arms control negotiations. Alone among international treaties it formally discriminates between the rights and responsibilities of two classes of countries (nuclear weapons states and non-nuclear-weapons states) on the basis of historical accident and perpetuates and institutionalizes that distinction. Furthermore, it has also provided a mechanism by which most countries of the world jointly agree that the acquisition of nuclear weapons enhances neither their security nor their status. What is needed to complete or complement the regime is the will to assert to those nonparties who threaten to proliferate that if they do the United States will surely take whatever actions are necessary to see to it that they gain neither prestige nor security from it (and one hopes that other advanced industrial countries will join in this effort). Only in this way can further proliferation by nonparties be discouraged.

Sadly, there is no present evidence that either the United States or the Soviet Union can credibly make such a threat, which would clearly involve such strategies as a complete embargo on all military supplies of any kind, economic and trade sanctions, and so forth. To put it another way, the threat of nuclear proliferation is evidently considered less serious than the loss or alienation of such "allies" as Pakistan or South Africa. Taken together with our obvious disinclination to place sustaining and reinforcing the NPT regime above the priorities that drive the nuclear arms race, there is good reason to be pessimistic about outcomes within both of the nonproliferation regimes. But the two regimes are threatened by different sets of events in different time frames. Since the NPT regime is so much more robust and general, so much more broadly based, and so much more

valuable in the long run than the informal one, it is neither accurate nor wise to tie them together as if there were no major distinctions between them.

Gene I. Rochlin
University of California
Berkeley, California

* * *

The alarm that Leonard Spector expresses about the dangers of horizontal proliferation is valid, but too narrowly focused. In concentrating on the developing countries, he has slighted the dozen or so nations that would have far less difficulty in producing nuclear weapons quickly.

Almost all the major industrialized nations have the fissile materials, technology, knowledge, personnel, and facilities to make weapons if they so choose: Austria, Belgium, Germany, Italy, Japan, Sweden, and Switzerland, to name a few. Although international and multilateral safeguards make weapons conversion very difficult to conceal, they could renounce the Non-Proliferation Treaty. Rather than capability being the controlling factor, the industrialized states' lack of interest in nuclear weapons depends much more on the ultimate disadvantages of possession.

In his article, Spector mentions a vital point missing from his book (*Nuclear Proliferation Today*, 1984): the Non-Proliferation Treaty might unravel because of the nuclear arms race between the superpowers. Through the example of endless arms production, the nuclear-weapons states are enticing other nations to develop their own arsenals. The nuclear powers must make some progress in arms control if they expect the current stagnation in horizontal proliferation to continue.

Therefore, policies that only emphasize restrictions on technology available to developing countries are too limited. The nonproliferation regime is indeed fragile; it is much more dependent on political will than on mere technological ability.

Spector overstates the danger that the Madras nuclear power plant might supply plutonium for weapons. Intended to alleviate India's energy needs, that plant would have to be operated in a very inefficient and obvious mode in order to issue weapons-grade plutonium. India has already demonstrated that it can make nuclear explosives by the same route used by every one of the nuclear-weapons states—dedicated military facilities, not civil power plants.

Although apprehension about the proliferation of nuclear weapons is justified, attention should encompass the full range of realistic problems and place them in perspective.

Alex De Volpi
Bolingbrook, Illinois

* * *

Leonard Spector's response: I agree with most of Gene Rochlin's points on the importance of the NPT; our differences seem to be largely definitional. The more widely held view, I believe, is that the nonproliferation regime is a single totality, a composite of mutually reinforcing treaties, bilateral accords, supplier-country controls, international organizations, and ad hoc diplomacy—all aimed at preventing the spread of nuclear arms. The NPT is only one element, however important, of this larger regime. In this light, Pakistan's emergence as a new de facto nuclear-weapons state would represent a serious failure of the regime as a whole, even if certain elements of it appear to be functioning successfully.

I would add that Rochlin's dichotomization of the nonproliferation system into the formal NPT regime and a second informal regime directed at six key non-NPT parties seems somewhat artificial. The United States, for one, has routinely used "informal" diplomatic pressure to retard potentially dangerous nuclear activities in such NPT-parties as Iraq, Iran, Libya, Egypt, and South Korea. Conversely, the six nonsignatories are members of the International Atomic Energy Agency (IAEA), have entered into numerous bilateral nuclear agreements, and are subject to the Nuclear Suppliers' Group export controls—all formal elements of the regime.

Turning to Alex De Volpi's comment questioning the importance of the unsafeguarded Madras I Atomic Power Plant to India's nuclear weapons potential, I would point out that New Delhi, according to Indian press accounts, kept the plant idle for two years rather than purchase needed heavy water from the Soviet Union since this would have meant placing the reactor under IAEA safeguards. This conduct is hard to square with the position that New Delhi views the plant strictly as a means "to alleviate India's energy needs." Moreover, the plant's potential annual output of 60 kilograms of weapons-grade plutonium is considerable when compared to the potential output of India's two large unsafeguarded research reactors, CIRUS and the R-5. Estimates for the combined plutonium production at these two facilities range from 32 to 59 kilograms per year, and the R-5 is not yet operating, apparently because of a lack of indigenously produced heavy water.

It should be added that operating an on-line, loaded CANDU-style reactor like Madras I to produce weapons-grade plutonium is by no means "inefficient," except in the sense that more uranium is passed through the reactor than normal; and, in any event, producing comparable amounts of plutonium in the CIRUS and R-5 reactors would require

irradiation of comparable amounts of uranium. It would also require considerably more time if the reactors' capacities are at the low end of the estimates noted above.

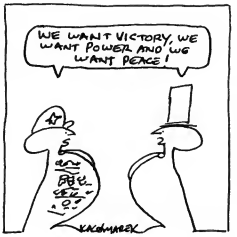
Moreover, at Madras, electricity production could at least partly offset the reactor's operating costs, much as it has at the U.S. N-reactor at Hanford, at Britain's Calder Hall plant, and at certain French reactors at Marcoule. This would make plutonium production at Madras far more "efficient" than the alternative of using research reactors. Adding to the credibility of this scenario, finally, is the fact that U.S. and IAEA officials have long been concerned that Pakistan's similar, if somewhat smaller, CANDU power reactor at Karachi might be used to produce plutonium for weapons.

Defining first strike

In "The Drift toward First Strike" (*Bulletin*, January 1985), William Arkin addresses definitions of first strike. Secretary of Defense Caspar Weinberger has frequently presented his: "A first strike weapon is a weapon that is used first." This definition equates first use with first strike. Equally significant, it does not distinguish non-nuclear from nuclear weapons. This is a crucial distinction that critics of U.S. nuclear weapons use policy are attempting to establish.

It is undisputed that the NATO-U.S. policy of deterrence since World War II has been intended to deter non-nuclear as well as nuclear attack. A "weapon that is used first" can easily mean a Soviet non-nuclear weapon. Thus Weinberger's definition would not cover use of U.S. strategic nuclear weapons in a preemptive damage-limiting strike against Soviet strategic missiles if the U.S. weapons are used in retaliation to a Soviet non-nuclear assault. Rather, the definition appears carefully crafted to cover just such a scenario.

If Soviet first use of non-nuclear weapons is a first strike, then U.S. use of strategic nuclear weapons in response is a second strike. This would include release of MX missiles from vulnerable



Erv Kaczmarek, Mexico

silos. That is, under Weinberger's definition, not every preemptive nuclear strike is a first strike.

Since people in power give effective meaning to disputed definitions by their actions, the potential of Weinberger's ambiguous first use/first strike definition to embrace a preemptive nuclear "second" strike should be challenged and clarified. Agreement of terms is a minimum requirement of reasoned debate. Is the objective of the U.S. Constitution "to provide for the common defense" reasonably served by a policy that puts U.S. cities at risk of nuclear annihilation in order to deter Soviet tanks from crossing into Western Europe? This is the question that is masked by Weinberger's duplicitous definition of first strike.

Claire Thomas
Bellevue, Washington

Abandon the MX

Now that the Reagan Administration has formally agreed to resume arms negotiations with Moscow, the role of the MX must again be debated, focusing on four points:

- Air Force Brig. Gen. James P. McCarthy of the MX program stated in November 1982 that a Soviet attack on the present Minuteman silos would drop the U.S. ICBM survival rate to less than 10 percent. For the United States to deploy the MX in those same Minuteman silos is to stand reason upside down.
- If the MX is placed in a vulnerable basing mode and cannot maintain a credible second-strike role, then it must assume a destabilizing first-strike role. Anthony Lewis in the *New York Times* wrote: "If a moment of tension comes, if the Russians are misled into thinking we are about to launch, they might be tempted to launch, they might be tempted to hit the MX's first." The U.S.-Soviet nuclear relationship cannot be insulated from the vagaries and spasms of their political relationship. Another incident like that of the Korean airliner might spark a much wider conflict. Operational MXs could tip a crisis over the edge.
- The Administration and Congress both seek to cap the burgeoning deficit. Elimination of the MX system (estimated at $26 billion) in favor of the Midgetman would save approximately $15 billion.
- There exists on Defense Department drawing boards an alternative to the MX: Midgetman. The president's own commission on strategic forces endorsed the concept of a mobile, single-warhead missile. The mobile Midgetman, deployed in large numbers, would serve as the ideal retaliatory weapon and thereby stabilize the U.S.-Soviet strategic relationship. Jonathan Medalis's study for the Congressional Research Service noted that a soft-mobile deployment—that is, capable of highway deployment—would cost $700 million to develop and $9.7 billion to produce 1,386 missiles. Also, Richard L. Garwin, former member of the Pentagon's Defense Science Board, has stated that deployment of the Midgetman, once started, could be completed in two years.

David Ormsby
Bolingbrook, Illinois

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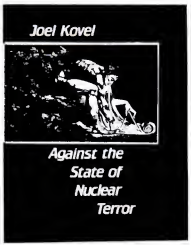

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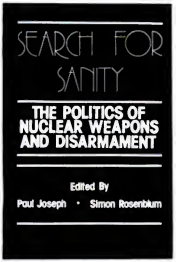

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